

# SURGERY.

**Surgery.** THE term *Surgery*, or *Chirurgery*, from *χειρ*, the hand, and *ργον*, work, originally signified, as its derivation implies, the manual procedure, by means of instruments or not, directed towards the repair of injury and the cure of disease; in contradistinction to the practice of *medicine*, denoting the treatment of disease by the administration of drugs, or other substances supposed to be of a sanative tendency. Such a meagre description applied but too justly to surgery in its infancy, and still more after its separation from its twin-sister medicine, in the twelfth century. When its practice was denounced by the Council of Tours as derogatory to the dignity of the sacred office of the priesthood, and beneath the attention of all men of learning, the term *chirurgery*, in its most literal interpretation, was quite sufficient to comprehend the duties of the degraded and uninformed surgeon, who had become a mere mechanic, attached to and completely dependent on the learned and philosophic physician. But the matured progress of the healing art has, fortunately for science and humanity, rendered such a definition of surgery in these days utterly untenable. Its complete separation from medicine would now be attended with the utmost difficulty; nor is it desirable that the attempt should be made, because its success, however partial and imperfect, would be most hurtful to both. They are now, and it is to be hoped will ever remain, one and inseparable. Their principles are the same throughout, and the exercise of their different branches requires the same fundamental knowledge; but their details are so numerous and intricate as to render it most difficult, if not impossible, for any one individual to cultivate all with equal success. The consequence has been, that while the theory and principles of physic and surgery remain united, as constituting one and the same science, the practical parts are now frequently separated into distinct professions, each person adopting that department most congenial to his pursuits, and for the management of which he conceives himself best qualified. The separation however is not that of acquirements, but merely of practice. It should never be forgotten, that the physician, before he can be either accomplished or successful in his profession, must be intimate with the principles, if not with the practice of surgery. And most certainly no one can ever lay just claim even to the title of surgeon, far less hope for eminence or success, unless he be equally qualified to assume both the appellation and the employment of the physician.

Many and laboured have been the attempts to define surgery according to its present state, so as to prevent interference with the department of physic. This example we will not follow. The arrangement as to what is medical, and what surgical, must in a great measure depend on custom, not on fixed and permanent rules. The paths of the practical surgeon and physician are distinct, but in their course they must often cross each other; and these collisions, so far from being avoided, ought rather to be sought, as probable sources of mutual benefit, so long as those enlightened feelings are entertained, and that honourable conduct pursued, which ought ever to distinguish the followers of a liberal, useful, and learned profession.

The limits allotted to this article not permitting us to enter into the details of surgery, we must content ourselves with a sketch of its history, and with some account of its improved condition as it is at present practised.

That surgery is as old as man himself, that it was coeval with his fallen state, there can be little doubt. The fall entailed the frequent reception of injuries by external violence; and to assuage their pain and remove their in-

convenience, the ingenuity and contrivance of the sufferer were powerfully excited. Thus it would seem, that as to antiquity of origin, surgery must take precedence of medicine. And after wars and dissensions began to prevail, and wounds and injuries became both more frequent and more deadly, it is most probable that to these the practitioners of the healing art alone directed their attention, before the nature of disease began to be understood, or its cure was supposed to be within the reach of human means.

As to the state of surgery among the early Egyptians, we know but little, except that it was customary, in the time of Joseph, to embalm the dead; a process which appertains closely to both medicine and surgery. There are some grounds, however, for suspecting that they were more conversant with surgery than is generally supposed; for it is said that on "the ruined walls of the renowned temples of ancient Thebes, basso-relievos have been found, displaying surgical operations, and instruments not far different from some in use in modern times." Their medical practice, entirely founded on incantation and astrology, was sufficiently simple. They divided the body into thirty-six parts, believing in an equal number of demons, to whom those parts were intrusted, and to invoke whose aid in sickness was the principal duty of the physician, each spirit being called upon to cure his own peculiar portion.

Among the Jews, the operation of circumcision was performed, no doubt skilfully and dexterously, though with rude implements, by the priesthood, an order which, for many ages, and in many climes, conjoined the cure of the body with that of the soul.

The earliest notice of this art is from the ancient Greeks, who, it is probable, had derived their medical traditions from the Egyptians. They considered medicine to be of divine origin; and its first professors, as they inform us, were no less personages than gods and sons of gods.

Medicine and surgery, at their origin, were conjoined; and both continued to be practised indiscriminately, until separated by the Arabian school. Their complete estrangement occurred, as we have already stated, about the middle of the twelfth century. At first, surgery chiefly occupied the attention of the ancient leech, as the more certain and more obviously useful branch of his profession; but ultimately it became very secondary to medicine when dignified by philosophy and priestcraft.

Chiron the Centaur, born in Thessaly, is presumed to have been the father of surgery, celebrated for skilfully applying soothing herbs to wounds and bruises. But his fame is somewhat endangered by that of *Æsculapius*, the son of *Apollo*, by some held to be the pupil of Chiron, by others, his predecessor and superior. *Æsculapius* is supposed to have been deified, on account of his skill, about fifty years before the Trojan war. His very existence however has been questioned. *Apollo* was the original god of physic among the early Greeks; but he appears to have resigned in favour of *Æsculapius*, whose temples became the depositories of medical and surgical knowledge; more particularly those of *Epidaurus*, *Cnidos*, *Cos*, and *Pergamus*.

Certain it is, according to the testimony of *Celsus*, that *Æsculapius* is the most ancient authority in surgery. His immediate descendants, two sons, *Podalirius* and *Machaon*, have been immortalized by *Homer*. They followed *Agamemnon* to the Trojan war, and there their services were so highly valued as to secure them a not unobscure niche among the heroes of the *Iliad*. Of the two, *Machaon* seems to have been the more distinguished. When he is wounded by *Paris*, the whole army is represented as interested in

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**Jews.**

**Greeks.**

**Chiron.**

**Æsculapius.**

**B. c. 1192.**

**Agamemnon.**

**Paris.**

**Æsculapius.**

**Podalirius.**

**Machaon.**

**Agamemnon.**

**Surgery.** his recovery. Even the stern Achilles inquires anxiously after "the wounded offspring of the healing god;" and the valiant Nestor, to whose care he is intrusted, is exhorted to unwonted exertion in his behalf; "for a leech who, like him, knows how to cut out darts, and relieve the smarting of wounds by soothing unguents, is to armies more in value than many other heroes." Podalirius enjoys the distinction of being reputed the first of phlebotomists, and probably the most successful, from his time to this; having opened a vein in either arm of the king of Caria's daughter, who had been severely injured by a fall from the house-top, having, after her recovery, been rewarded with the hand of the fair princess, and having been presented by her munificent father with the Chersonese as her dowry. As to medicine, they seem to have been either ignorant, or in no great repute; for, on the breaking out of pestilence in the Grecian camp, Homer neglects them entirely, and applies at once to Apollo. And even their surgical attainments, for which they are celebrated by him, seem to have extended no farther than to the simple extraction of darts and other offensive weapons, the checking of hæmorrhage by styptics or pressure, and the application of lenitive salves. The poet takes notice of his warriors sustaining fracture of the bones; but in such emergencies he adopts the same course as in the pestilence, and invokes the aid of the non-professional deities; from which circumstance we may infer, that in those days surgery had made but little advancement.

**Asclepiades.** For upwards of 600 years after the Trojan war, there are scarcely any accounts of medicine and surgery. They seem to have remained strangely stationary during the whole of that period. Their practice was confined to the Asclepiades, or reputed descendants of Æsculapius; whose lore was orally communicated from father to son in that family, until they received an extraordinary impulse from the great Hippocrates, himself a branch of the family, and said to have been the fifteenth in lineal descent from the deified founder. The Asclepiades, in the course of their monopoly, established three schools of medicine, at Rhodes, at Cnidos, and at Cos. The last gave Hippocrates to the world, and thus attained a proud and enduring pre-eminence.

**Pythagoras,**  
B. c. 600. Pythagoras was the first who brought philosophy to bear upon the practice of the healing art, and led the way in raising it to the dignity of a science. Democritus, the happy sage, likewise turned his attention to medicine as a branch of general philosophy, and pursued it zealously. He lived in terms of friendship with Hippocrates, by whom he was held in great respect. By Pythagoras a school at Crotona was founded, about the time of Tarquinius Superbus, espousing doctrines somewhat different from those of Cos and Cnidos. It produced Damocedes, a contemporary of Pythagoras, who seems to have practised in Athens, an honoured and successful surgeon. By Polycrates, king of Samos, he was presented with two talents of gold for having cured him of a troublesome distemper. He was afterwards taken captive by the Persians. Their king, Darius, was intrusted to his care for a dislocated ancle, as well as the queen, Atossa, for a cancer of the breast; and he was soon loaded with honour and wealth on account of his wonderful cures, performed after the Egyptian physicians, previously in attendance, had signally failed.

**Damocedes.** But we cannot suppose such men as Damocedes and the Asclepiades to have attained any great proficiency in surgery; for the touch of a dead body was interdicted as a profanation both by Jew and Greek, and consequently they must have been almost entirely ignorant of anatomy. They may have understood something of the skeleton, from their practice amongst fractures and dislocations; and they may have formed some general idea of the viscera, from researches in comparative anatomy, and from instruction by the Egyptians, whose practice in embalming afforded ample scope for observation. But the minute structure of the

human body must have been to them a profound mystery. **Surgery.** And, knowing that anatomy is, was, and ever must be, the foundation of true surgical knowledge, we cannot evade the conviction that surgery, though occasionally successful and honoured in ancient times, must have been nothing more than a rude, imperfect, and uncertain art. The practice of its professors seems to have been extremely limited, consisting of little more than the binding up of wounds, and the staunching of hæmorrhage by styptics and the cautery; the extraction of darts and other missiles from the wounds which they had inflicted; phlebotomy, both general and local; and cupping by scarification. Whether they practised the capital operations or not, we are not informed; but it is probable that their comparative ignorance of anatomy effectually deterred them from any extensive division of the soft parts, as extremely hazardous and uncertain.

Hippocrates, born in the 80th Olympiad, upwards of 400 years before the Christian era, did more for medicine and surgery than all who had preceded him; and indeed few of those who have succeeded him have been of equal service to the profession. He soon freed medicine in a great measure from the absurdities with which ignorance and superstition had invested it; and through a long, honoured, and glorious life he set a splendid example of persevering industry, philosophical research, and high moral worth. His fame soon raised the Coan school far above its rivals. Though his anatomical knowledge seems little better than a blending of ingenuity with error; yet he appears to have had some indistinct notions of the circulation of the blood; but Dr Pitcairne, in his "*Solutio Problematis de Inventoribus*," has sufficiently evinced that he was very far from anticipating the great discovery of Harvey. With all his deficiencies, and notwithstanding all the disadvantages under which he laboured, so correct was his observation, and so faithful his chronicling of disease, that many of his descriptions may be fairly inserted in our modern nosologies. Though his attention was chiefly directed towards the improvement and promotion of physic, now begirt with philosophy, and studied as a science, and though his practice was principally confined to the treatment of internal disease, yet he was not wholly inattentive to surgery. And his practice seems to have been tolerably bold and decisive; for, in regard to external disease, it was with him a maxim, that "when medicine failed, recourse should be had to the knife, and when the knife was unsuccessful, to fire;" a substance of which all the ancient doctors seem to have been particularly fond, from Prometheus downwards. Hippocrates employed it not only in a variety of diseases, but in various forms. Sometimes he applied red-hot irons to the part; sometimes he raised a conflagration on it, and of it, by a piece of wood dipped in boiling oil, or by burning a roll of flax after the manner of the modern moxa. He also made use of tents and issues, as more gentle means of counter-irritation. He seems to have performed the capital operations with boldness and success, excepting lithotomy, the practice of which appears to have been confined to a few who made it their exclusive study. He however recommends the removal of calculus, large and firmly lodged in the kidney, by incision; adding, probably in apology for the daring of the procedure, that otherwise there are no hopes of a cure, and that the disease must prove fatal. He reduced dislocations, and set fractures, but clumsily and cruelly; extracted the fœtus with forceps when necessary; and both used and abused the trepan, employing it not only in depression and other accidents of the cranium, but also in cases of headach, and other affections to which the operation was inapplicable. In cases of empyema and hydrothorax, after ascertaining by percussion that fluid was present in the cavity of the chest, he did not hesitate to make an incision between the ribs; and having allowed part of the fluid to escape, he placed a tent in the wound, and by withdrawing it regularly once a day, the whole was ulti-

**Surgery.** mately evacuated. He seems to have been perfectly acquainted with tetanus and spontaneous gangrene; observing, that even minute wounds of tendinous parts, as the fingers and toes, sometimes produce convulsions which terminate fatally; and that black spots on the feet frequently increase to extensive gangrene and incurable mortifications. Some of his practices have been long and justly exploded, some have been successfully continued, and others have, after disuse, been revived as modern inventions. For example, his method of ascertaining the presence or absence of fluid in the chest was by percussion, and applying the ear to the part, thus anticipating the use of the modern stethoscope. One of his modes of counter-irritation, we have seen, was by burning flax on the part, as in the modern moxa; and he strongly recommends the production of eschars on the back and breast in the earlier stages of pulmonary disease, thus anticipating the supposed valuable discoveries of a celebrated modern charlatan. His writings are elegant, and well repay a careful perusal. By them he made posterity his debtor; his contemporaries were not insensible to his merits, and endeavoured to reward them during his life. The inhabitants of Argos voted him a statue of gold; he was more than once crowned by the Athenians, and, though a stranger, was initiated into the most sacred mysteries of their religion, the highest distinction which they could confer; after his death, universal and almost divine honours were paid to his memory; temples were erected to him, and his altars covered with offerings.

We have already seen that surgery had long been stationary before the time of Hippocrates; and it made but little advancement during many succeeding generations. The Asclepiades had confined the knowledge of medicine among themselves; Hippocrates, however, gave oral instructions in anatomy and the art of healing, and thus disclosed its mysteries to the world. But few of his disciples seem to have profited much by his liberality. One of them, his kinsman Ctesias, we are told, acquired considerable renown for his skill; and having been taken prisoner by Artaxerxes Mnemon, in a battle fought against his brother Cyrus, was successful in curing him of a severe wound, and thus obtained favour with his captor. Plato began to flourish about this time; but though he was connected with medicine, we cannot lay claim to him as eminent in surgery; and he was more famous for his philosophy than his physie. Perhaps the most distinguished in surgery, among the more immediate successors of Hippocrates, was Dioecles Carystus. He devoted more attention to anatomy than any of his predecessors, was curious in bandaging wounds of the head, and invented the bellulon, an instrument for extracting darts. Carrying his surgery into the practice of medicine, he was not very happy in the result; from observing that external wounds, abscesses, and inflammations were attended with fever, he supposed that general fever was uniformly occasioned by one or more of these causes operating internally. He followed Hippocrates in practice, and, like him, cultivated his profession, "not for lucre or vain-glory, but from real love of the medical art, and a pure spirit of humanity." Praxagoras of Cos was the last of the Asclepiades who succeeded in leaving a name behind him. As a surgeon he is reported to have been bold in the extreme, incising the fauces freely, and excising portions of the soft palate, in bad cases of cynanche; and making incisions into the bowels to remove obstructions, when milder measures failed. Aristotle, the celebrated preceptor of Alexander the Great, although not strictly in the medical profession, was the promulgator of doctrines which for a long time had a powerful effect on medicine. While he followed out the general principles of the healing art, and

was curious in anatomical research, he seems to have disdained to meddle with the practical details, and among the rest those of surgery.

On the dismemberment of the vast empire of Macedo-Egypt. nia after the death of Alexander the Great, learning took up its chief abode at Alexandria, under the protection of Ptolemy Soter. And here it was that popular prejudice B. c. 300. first gave way, and permitted the examination of dead bodies, the greatest possible boon to the medical profession, inasmuch as it removed what had hitherto been the most serious obstacle to its advancement, ignorance of human anatomy. Herophilus and Erasistratus, the two great heads of the Egyptian medical school, were the first who had an opportunity of practising human dissection, the bodies of criminals having been given to them for that purpose; and they consequently not only corrected many errors, but made numerous and important discoveries, in anatomy; thus imparting a fresh stimulus, and affording a new and more solid basis to both medicine and surgery. By some they have been accused of carrying their enthusiasm in this inquiry to such an extent as to "open the bodies of living criminals for the furtherance of their physiological views;" but this is probably a mere exaggeration, originating in the horror with which human dissection was at first regarded; a horror which unfortunately is not even in our day altogether extinguished, notwithstanding the recent legislative enactments in favour of anatomical research. But we find even these privileged men falling into most palpable mistakes; for example, Herophilus plainly confounds the tendons and ligaments with the nerves. Yet the fact that the names which he gave to many parts still remain in use, will of itself remind posterity how much they are indebted to him for his anatomical labours. He was likewise one of the greatest surgeons of ancient times, and, as well as Erasistratus, acquired as much fame for brilliant cures as for anatomical knowledge. The surgical practice of the latter was characterized by peculiar boldness and decision, and strongly marked with the failing of his time and school, a love of multiplying and inventing murderous implements, and the relentless use of them. "In schirrosities and tumours of the liver, he did not scruple to make an ample division of the integuments, and try applications to that viscus itself. He followed the same practice in diseases of the spleen, which he regarded as of little consequence in the animal economy." And perhaps he was right in his supposition, though not in his practice. In cases of retention of urine, he made use of the particular catheter which long bore his name. Xenophon of Cos, said to have been a follower of Erasistratus, seems to have been among the first who arrested hæmorrhage from a member, by encircling it tightly with a ligature. Mantius, a pupil of Herophilus, wrote a treatise on surgical dressings, which he rendered complicated in the extreme. Another, Andreas of Carystus, wrote on the union of fractured bones, and invented several ponderous machines for reducing luxations of the femur. Indeed the surgeons of the Alexandrian school were all distinguished by the nicety and complexity of their dressings and bandagings, of which they invented a great variety. Among them, as in the time of Hippocrates, lithotomy was practised by particular individuals, who devoted themselves exclusively to that operation; and we are told that one of them, Ammonius, employed an instrument, by means of which he broke down stones in the bladder, plainly anticipating Civiale, and furnishing a marked example to the present age of the truth of Solomon's apophthegm, that "there is nothing new under the sun."<sup>1</sup> It is not improbable that some of their other practices might have afforded equally

<sup>1</sup> A curious illustration of this is given by Dr James Johnson, in the narrative of his visit to Pompeii. "The Dilator or Speculum, for which Mr Weiss of the Strand obtained so much repute a few years ago, has its exact prototype in the Bourbon Museum at Naples. The coincidence in such an ingenious contrivance would be absolutely miraculous; but unfortunately there is a key to the similitude, which de-

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striking examples of this sometimes unpalatable truth; but unfortunately the greater part of the writings of the Alexandrian school perished in the conflagration of the famous national library in the time of Julius Cæsar; a calamity fraught with immense loss to the healing art, as well as to almost every other branch of knowledge.

Rome.

The arts and sciences followed the seat of empire in its transfer to Europe under Julius Cæsar, and Rome became the grand centre of intellectual illumination. Notwithstanding the shrewd sense displayed by the ancient Romans in most matters, it is strange, yet true, that for centuries all ranks of society, from the mere plebeian rabble to the censor, had entertained an abhorrence of all practitioners of medicine and surgery, and trusted for cures to spells and incantations. Indeed public edicts were issued, "discouraging all countenance to the professed exercise of physic, and recommending faith in traditionary prescriptions and religious rites." Cato the censor managed the sick of his own family according to the terms of this edict, and gravely wrote down the words of incantation for curing dislocation or fracture. For nearly the first 600 years of its existence, Rome, accordingly, had no regular practitioner of medicine. The first we read of was Archagathus, a Greek, from the Alexandrian school, who practised in Rome, chiefly as a surgeon, during the consulates of Lucius Æmilius and Marcus Livius. At first his surgical skill obtained for him no inconsiderable fame, but the ancient prejudice soon revived in full vigour. An enraged populace—perhaps not without some reason, for he seems to have been particularly fond of the knife and cautery—compelled him not only to suspend his practice, but, changing his original title of "healer of wounds" to that of "executioner," caused him to be banished from the Roman capital. Afterwards, however, a native of Bithynia, assuming the name of Asclepiades, established himself in tolerable repute by virtue of insinuating manners, shrewd common sense, and the performance of several fortunate cures—"tuto, cito, et jucunde." But with him we have little concern, for his sagacity soon taught him that it was essential to his welfare to avoid the unpopular practice of surgical operations, and accordingly he confined himself entirely to the apparently less hurtful administration of medicine. The only important traces of his surgical practice are, that in ascites he practised and recommended discharge of the accumulated fluid by minute punctures of the abdominal parietes; and that for quinsy, which term probably comprehended many of the various acute diseases of the throat now known and distinguished, he not only employed bold blood-letting, local and general, by the lancet and by cupping, but also had recourse to scarification of the fauces, and even attempted laryngotomy. By novel and successful cures in his medical practice, and frequent indulgence in skilful quackery, he obtained great personal reputation, and so far overcame popular prejudice as to establish a tolerably fair field in Rome for future practitioners. He was the contemporary of Cæsar, and the personal friend of Cicero. The latter is eloquent in his praise, and through him seems to have formed a high estimate of the medical

Archagathus.

Asclepiades, 96 B. C.

character. "Nothing," says he, "brings men nearer to the gods, than by giving health to their fellow-creatures." It would thus seem that, in his time at least, the ancient grudge against the doctors had abated in Rome. Among the disciples and immediate followers of Asclepiades was Cassius, described as Iatro-Sophista, who left behind him several works on anatomical and surgical subjects. In one of the latter he distinctly accounts for wounds on one side of the head producing paralysis on the other, from the decussation of the nerves; a tolerable proof that he was not only a good anatomist for the time, but also an observant practitioner.

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Cassius.

Rome itself did not produce a single medical practitioner of any reputation before the age of Aulus Cornelius Celsus, although he himself chooses to be complimentary to some of his immediate predecessors, "Tryphon, Euelpistus, and Mege, the most learned of them all." Celsus, the contemporary of Horace, Virgil, and Ovid, likened to Hippocrates for the quantity of his sound practical information, and to Cicero for the elegance of his style, lived in the reigns of Tiberius, Caligula, Claudius, and Nero, in the beginning of the first century of Christianity, upwards of 150 years before Galen.<sup>1</sup> In his celebrated medical work, he places great reliance on Hippocrates and Asclepiades, more particularly the latter, and gives a complete and excellent digest of all the true medical and surgical knowledge of his times, although it is not certain that he himself either practised medicine or operated in surgery. "Of his surgical operations and remarks, many are yet far from being obsolete, and impress us with a high idea of his ingenuity and judgment. His mode of performing lithotomy (on the gripe) has been in recent times warmly defended by Heister, especially as applicable to children. He describes the operation for cataract by depression, and the method of forming an artificial pupil. The whole of his account of injuries of the head is admirable, and evinces wonderful tact and discrimination. His rules for distinguishing fracture, and for the application of the trepan, have been highly eulogized; nor is what he says about contrecoups less accurate. He is the first who has remarked that there may be rupture of a vessel within the cranium without fracture or depression." And he is the first who recommended the application of ligatures to a wounded artery, with the view of arresting its hæmorrhage, after pressure has failed. He improved amputation, an operation then not much in use; and recommended its adoption in cases of gangrene from external causes. He is minute in his details as to the treatment of fracture and dislocation; his description of carbuncle is good, and its treatment similar to that now pursued, namely, free application of the strongest escharotics to the gangrened part. He describes several species of hernia, and gives directions for their reduction. "It would be endless however to particularise. Whoever wishes to know the exact state of surgical knowledge in the world at the time of the Cæsars, may turn to the pages of Celsus, with the hopes of a gratification which will not be disappointed."<sup>2</sup>

Celsus.

Aretæus, born in Cappadocia, practised in Rome, proba-

stroys the charm of astonishment. A crafty Frenchman imitated from memory, and with some awkward deviations, the Pompeian Speculum, and passed it off as his own. Weiss improved upon the Frenchman, and hit upon the exact construction of the original! Many modern discoveries may probably have originated in the same way."

<sup>1</sup> A life of Celsus by Joannes Rhodius is subjoined to the second edition of a work of that learned Dane, entitled "De Acia Dissertatio, ad Cornelii Celsi mentem, qua simul universa Fibulæ ratio explicatur." Hafniæ, 1672, 4to. We must likewise refer our philological readers to "Jo. Baptistæ Morgagni in Aur. Corn. Celsum et Q. Ser. Samonicum Epistolæ, in quibus de utriusque Auctoris variis Editionibus, Libris quoque manuscriptis, et Commentatoribus disseritur." Hagæ-Com. 1724, 4to. The prænomen of Celsus appears to have been Aulus, and not Aurelius, which is a "nomen gentile." See Fabricii Bibliotheca Latina, tom. ii. p. 37. edit. Ernesti.

<sup>2</sup> He relates an interesting anecdote of Hippocrates, illustrative of his abuse of the trepan. "Knowing and skilful as he was, he once mistook a fracture of the skull for a natural suture; and was afterwards so ingenuous as to confess his mistake, and leave it on record." To this he adds, "This was acting like a truly great man: little geniuses, conscious to themselves that they have nothing to spare, cannot bear the least diminution of their prerogative, nor suffer themselves to depart from any opinion which they have embraced, how false and pernicious soever that opinion may be; while the man of real ability is always ready to make a frank acknowledgement of his errors, especially in a profession where it is of importance to posterity to read the truth!" a moral which cannot be too often forced upon the attention of the present generation.

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**Surgery.** bly about the time of Domitian. He was the first who made use of blisters, using cantharides for that purpose. Dissection in his time was prohibited under the severest penalties: his anatomical knowledge was therefore neither profound nor exact; "nevertheless he had the sound penetration to regard anatomy as the only legitimate basis on which either medical or surgical science could rest." Heliodorus, the celebrated physician of the emperor Trajan, has left some excellent observations on injuries of the head; and Antyllus, almost a contemporary, was a zealous and successful surgeon. He boldly recommends bronchotomy in cases of threatened suffocation induced by disease of the throat; and, in inflammatory affections of emergency, advises arteriotomy in preference to venesection, showing that excessive loss of blood thereby need not be dreaded, it being readily prevented by dividing the artery completely across. He also alludes to the operation for cataract by extraction, which he however recommends very cautiously, and only when the cataract is small. He obtained the radical cure of hydrocele by free incision of the parts. Rufus the Ephesian, who seems also to have lived in the time of Trajan, was a zealous anatomist and surgeon, and has left a treatise on diseases of the kidneys and bladder. About the commencement of the second century, Archigenes the Syrian settled in Rome, and distinguished himself both in medicine and surgery. His writings, which were chiefly confined to the latter subject, are unfortunately lost. Between Celsus and Galen, however, we meet with no great Roman writer on medicine or surgery. These were among the last of the liberal arts that were encouraged by the Romans; and the proud patricians refusing to educate any of their family to such a profession, the medical practitioners of Rome were at first importations from Greece and Alexandria, and afterwards self-educated slaves and freedmen.<sup>1</sup>

**Rufus, A.D. 95-117.** Claudius Galenus was born at Pergamus, in Asia Minor, in the 131st year of the Christian era. After studying at Smyrna and Corinth, he completed his medical education at Alexandria, and ultimately settled in Rome, where he soon obtained a great reputation, both as a successful practitioner, and as a public lecturer on anatomy. Professional jealousy of his talents, however, drove him from Rome, to which he did not return until recalled by Marcus Aurelius. Shortly afterwards he was appointed physician to the young emperor Commodus, with whom, as well as with the public, he rose to great favour. A man of great erudition, brilliant genius, and indomitable industry, he produced works which exerted a most powerful and extensive influence over medical practice. He has the merit of rescuing medical inquiry from the chaos in which he found it, and restoring it to the paths of light and nature. His fame indeed was so great as to prove, in one sense, detrimental to the advancement of the medical profession, inasmuch as his opinions were received as oracular in the schools of all the civilized countries for no less a period than 1300 years, thus seriously retarding further investigation. His works were both numerous and elaborate; but unfortunately he seems to have been debarred from the study of the groundwork of his profession, human anatomy. His dissections appear to have been limited to the simiæ and other mammiferous animals, as most resembling the human structure, though on one occa-

sion "he felicitates himself on the opportunities he had enjoyed of examining two skeletons preserved in Alexandria, and recommends all anxious to obtain a thorough knowledge of osteology to repair to that city." In his early years, he practised surgery at Pergamus with marked success; but in Rome he seems to have confined himself almost entirely to medicine, excepting the occasional performance of phlebotomy: probably the valorous Romans had not yet lost their hatred and dread of the terrible operations of surgery. Like others, however, he was still so much of a general practitioner, as to practise pharmacy as well as medicine, with a little of surgery; and he himself informs us, that he had a drug-shop in the Via Sacra. "He established two general principles as the basis of all surgery—synthesis, or the reunion of parts—diæresis, or their complete division, as by amputation or extirpation. In four cases he detected luxation of the femur backwards, a variety not mentioned by Hippocrates; and records two instances of spontaneous luxation of the same bone. He also treats of more than one species of hernia. But although in his writings we meet with a few bold chirurgical attempts, as in the application of the trepan to the sternum in a case of empyema, yet it must be confessed that by far the greatest part of his surgery seems to have been confined to fomentations, ointments, and plasters, for external affections, together with the art of bandaging, a love for which he necessarily acquired at the Alexandrian schools; and the employment of complicated machinery in fracture and dislocations." His researches were not limited to medical science, but comprehended literature and philosophy.<sup>2</sup>

The early Christians unfortunately appear to have injured medicine and surgery, by attributing to martyrs and their relics the power of healing wounds and curing diseases; "acknowledging the active interference of demons and blessed spirits in the affairs of men, and leaving true philosophy in total abandonment." A Cimmerian gloom was then fast overspreading the world, by which science and art were destined to be long obscured; and shortly after the time of Galen, we accordingly find the medical along with the other sciences encompassed by the dark clouds of ignorance and barbarism. One or two names however occur worthy of notice, but more from having preserved than advanced medical knowledge. Oribasius, a pupil of Zeno, lived in the time of the emperor Julian, whose friendship he enjoyed, and became a celebrated practitioner, as well as of great importance in the state. His works are principally compilations, though judicious and useful. His surgery is marked with timidity, discouraging operations, except in most extreme cases, and is chiefly confined to unguents and embrocations. He abstracted blood locally, by making deep and extensive scarifications, or rather incisions, with the knife; a proceeding somewhat resembling the important modern improvement in the treatment of erysipelas, but adopted under different circumstances, and with other objects in view.

During the fifth century the west was repeatedly invaded by the Huns, Goths, Alans, and Lombards. Science greatly suffered in consequence; and no name worthy of remembrance is to be found, until, nearly two centuries after Oribasius, appeared Aëtius, a native of Amida, and a pupil of the

Oribasius, A.D. 350.

Aëtius, A.D. 500-550.

<sup>1</sup> On this subject, a remarkable controversy took place in England during the earlier part of last century. It was occasioned by Dr Mead's "Oratio Anniversaria Harveiana, in Theatro R. Medicorum Londinensium Collegii habita, ad diem xviii. Octobris, mdcclxxiii. Adjecta est Dissertatio de Nummis quibusdam a Smyrnæis in Medicorum honorem percussis." Lond. 1724, 4to. This was followed by a publication of Dr Middleton, "De Medicorum apud veteres Romanos degentium Conditione Dissertatio; qua, contra viros celeberrimos Jacobum Spornum et Richardum Meadium, servilem atque ignobilem eam fuisse ostenditur." Cantab. 1726, 4to. To this dissertation Dr Ward of Gresham College published an answer in 1727: Middleton published the first part of a defence in 1728, and Ward having rejoined in the course of the same year, his antagonist prepared a second part, of which Dr Heberden printed a few copies in 1761, eleven years after the author's death.

<sup>2</sup> Here we must refer our classical readers to a most important collection published under the title of "Medicorum Græcorum Opera quæ exstant. Editionem curavit D. Carolus Gottlob Kühn, Professor Physiologie et Pathologiæ in Literarum Universitate Lipsiensi Publicus Ordinarius." Lipsiæ, 1821-30, 26 tom. 8vo. Three of the volumes are each divided into two parts. This collection includes the works of Hippocrates, Aretæus, Dioscorides, and Galen. Dioscorides was edited by Sprengel, and the other writers by Kühn.

**Surgery.** Alexandrian school. "His surgical writings are copious and valuable. His opinions were guided by experience, and his methods of management and cure are characterised by much caution and discrimination. We find a variety of surgical queries and suggestions which had escaped Celsus and Galen, as well as the description of several diseases which have been omitted by Paulus Ægineta. He recommended and practised scarification of the legs in anasarca, and made free use of both the actual and potential cauteries; he cut out hæmorrhoidal tumours; operated for aneurism; tried to dissolve urinary calculi by the administration of internal remedies; and has given a series of interesting chapters on inflammation of the intestines followed by abscess, on encysted tumours, on the varieties of hernia, on diseases of the testicle and castration, on the pricks of the nerves and tendons, and in fact on almost every important branch of surgical knowledge. If, mixed up with these, we find some things which the matured experience of ages has abolished, it is less to be marvelled at, than that surgery was already enriched with so many valuable facts and observations." He makes no reference to the reduction of fractures and dislocations, whence it has been plausibly inferred, "that in all likelihood quacks were at that time in complete possession of this branch of practice. Better were it for society that it was quite out of their hands now!" He seems to have been the first to open up a field of medical inquiry, which has since been so successfully cultivated,—the nature and composition of urinary calculi. He appears also to have turned much of his attention to diseases of the eye, and is the first who speaks of the dracunculus or Guinea-worm.

Alexander, A. D. 527–565. physician in the time of Justinian, about the middle of the sixth century, was an author of more originality than either Oribasius or Aëtius. He wrote on diseases of the eye, and on fractures; but both treatises have been lost, which is the more to be regretted, as, with this exception, he confined himself entirely to internal disease. The celebrated Paulus Ægineta, also of the Alexandrian school, lived about the middle of the seventh century, and made both large and valuable contributions to surgery. He frequently performed the operations which he describes, and abandoned the labours of the mere theorist, for the more valuable results of practical observation and experience. "His sixth book has been considered by many, and not without reason, as the best body of surgical knowledge, previous to the revival of letters." He recommended bleeding from the immediate neighbourhood of the part affected, in preference to general blood-letting, because more effectual; and, for the like reason, opened the temporal artery in cases of very severe ophthalmia. He had recourse to copious venesection, with the view of accelerating painful descent of calculus in the ureter. He opened internal abscesses by caustics, and defined the points at which he thought it advisable to perform paracentesis in the different alleged species of ascites. In lithotomy, having first endeavoured to ascertain the situation of the calculus by the rectum, he made his incision, not in the centre of the perineum, as recommended by Celsus, but to one side of the raphe, as is now practised. Of the impropriety of extensive incision of the bladder he seems to have been well aware, directing that the external wound should be much freer than the internal, and that the latter should be in extent merely sufficient to admit of the passage of the stone. While Celsus limited the operation to patients between nine and fourteen

Paulus Ægineta, seventh century.

years of age, he sanctions its performance after the age of puberty, but admits that the chances of success increase with the youth of the patient. He described more than one variety of aneurism, pointing out those cases in which he thought it advisable to attempt a cure by operation; and extended this to the aneurisms of the head and joints, excepting only those of the groin, arm-pit, and neck, instead of confining it to the tumours of the arm alone, as had been done by Aëtius. All aneurisms, excepting aneurism by anastomosis, which he clearly and accurately distinguished, he conceived to originate in rupture of the coats of the artery. He performed extirpation of the mamma by crucial incision, and practised both laryngotomy and tracheotomy. He is the first who seems to have performed the latter operation as a means of carrying on respiration during occlusion of the larynx, but naturally enough falls into the error of transverse instead of longitudinal incision. He describes different species of hernia, and did not hesitate to operate when the tumour became strangulated. He is also the first who treats of fracture of the patella. He was pre-eminent as an accoucheur, and was the originator of the obstetric operation of embryotomy.<sup>1</sup> From the time of Paulus, we find no Greek or Roman surgeon of note, until the appearance of Actuarius, a Greek, who practised with great distinction at Constantinople, probably about the beginning of the twelfth century, but at what exact period it is impossible to ascertain. Among his writings are found several surgical treatises, which however possess no greater merit than as compilations from previous authors.<sup>2</sup>

Having thus traced surgery from its origin, through the Egyptian, Greek, and Roman dynasties, we come to notice the prolongation of its feeble existence in Arabia.<sup>1</sup> From Alexandria, captured by the Saracens under Amrou in 640, knowledge was gradually communicated to Arabia. Its people became acquainted with medicine through the medium of translations of the Greek authors; and the "seat of learning was transferred, for a time, from beneath the shadow of the cross to the empire of the crescent; from the classic shores of Italy and Greece, to the warlike followers of Mahomet, and the fiery descendants of Ishmael." Many valuable manuscripts, rescued from the savage destruction of the Alexandrian library, were carefully transcribed, or translated into the Syriac or Arabic languages, and dispersed in various directions. The first Arabic translation was made about the year 683, by Maserjawaihus, a native of Syria; but the most eminent in this labour was Honain, called, by way of eminence, "the translator," a Christian, born at Hira in 764. Towards the end of the eighth century, a college was founded at Bagdat by the Caliph Almanzor; and there medicine obtained a permanent footing, under the fostering care of the far-famed Caliph Haroun al Raschid. Public hospitals and laboratories were founded by him for the benefit of students, who are said to have amounted at one time to no fewer than six thousand, consisting chiefly of Christians banished on account of their religion; and the Caliph Almamon surpassed even his predecessors in munificent patronage, extended to every department of art and science, and in unwearied exertions to restore and propagate the various branches of learning. By supplication he prevailed upon the Grecian emperors to send him many works in philosophy; and, employing the best interpreters that he could find, ordered all these books to be translated, and encouraged the industrious study of them by his own personal example. The medical school at Jondisabour, the

<sup>1</sup> Mr Francis Adams, a very erudite surgeon practising in the vicinity of Aberdeen, has published the first volume of "The Medical Works of Paulus Ægineta, the Greek Physician, translated into English: with a copious commentary, containing a comprehensive view of the knowledge possessed by the Greeks, Romans, and Arabians, on all subjects connected with medicine and surgery." Lond. 1834, 8vo.

<sup>2</sup> Le Clerc, *Histoire de la Médecine*. Geneve, 1696, 8vo. Amst. 1723, 4to. Freind's *History of Physick*, from the time of Galen to the beginning of the sixteenth century. Lond. 1725–6, 2 vols. 8vo. Le Clerc only continues the history till the age of Galen. The literary history of the Greek physicians may be sought in the *Bibliotheca Græca* of Fabricius.

**Surgery.** capital of Chorassan, established by Sapore the First as early as the end of the third century, had by this time risen to great celebrity; and from it Rhazes, Hally Abbas, and Avicenna derived their medical education. Mesue lived during the caliphate of Haroun al Raschid, in the end of the eighth century, and Serapion during that of Almamon, about a century later; both eminent medical men in their time, but both pure physicians. The first Arabian worthy in the surgical department was the celebrated Rhazes, who presided over an hospital at Bagdat in the end of the ninth and beginning of the tenth centuries. His works are not remarkable for anatomical knowledge, which is not surprising, since the study of anatomy was strictly forbidden by the Mahommedan religion, and consequently the Arabians had to rest contented with the writings of the Greeks on that subject. "One of their religious prejudices against dissection was, that the soul did not instantly forsake the body, but lingered in some particular portion of it for some time after apparent dissolution, so that the dismemberment of it might be a species of hideous martyrdom;" a very sufficient reason why a professor of such a belief should strenuously object to the anatomization of himself and his friends. Rhazes is the first who has described spina ventosa and spina bifida. Of the real nature of the latter, however, he does not seem to have had any clear idea. Regarding cancer, he advised that the knife should never be used except when the disease was limited, and the whole tumour could be completely removed; condemning the opposite procedure as cruel and unavailing; an opinion which after-experience has shown to be most just and true. In bites from rabid animals, he first cauterized the wounds, and then prescribed emetics to expel the "black bile;" an evacuation considered most essential to the cure. His account of hernia is better than any to be found in the Greek writers. His works on surgery, however, are little more than compilations from Hippocrates, Oribasius, Aëtius, and Paulus. His confidence in oculism does not seem to have been great; for, having in his old age become blind from cataract, he could not, though urged, be prevailed upon to undergo an operation for its removal. In his time lithotomy, and some other operations, seem to have been entirely in the hands of juggling impostors. Hally Abbas, surnamed the Magician, on account of the extent of his knowledge and acquirements, lived in the end of the tenth century. His great work, the *Al-meleky*, written about the year 980, is, in its anatomical and physiological department, a mere transcript from the Greeks; and his surgery possesses but few peculiarities. "From the idea that caustics were efficacious when a redundancy of the humours flowed to a particular part, he recommended their application for the cure of hydrocele. In the management of dropsical affections his attention was always directed to the remote causes; and he preferred puncturing in the linea alba, a little below the umbilicus, for the relief of ascites." Avicenna, who divides with Rhazes the honour of having first introduced chemistry into physic, flourished later than the two preceding Arabians. He was termed, in his day, the Prince of Physicians, and seems to have been regarded as almost miraculous for the extent and variety of his knowledge. He was born in 980, and died in 1036, without a rival, either in the medical profession, or in general science. In his great medical work, the *Canon*, the surgical department is not altogether forgotten, but holds a second place to physic; indeed, before the appearance of Albucasis, surgery seems to have been all but extinct amongst the Arabians. He has distinguished between closure of the pupil and cataract, and in operating for the latter recommends depression; extraction he considers a very dangerous experiment. It is probable that to him we owe the first use of the flexible catheter. His works are said to have remained the oracles of medical knowledge for nearly six hundred years.

**Surgery.** Albucasis, who died in 1122, exerted himself more than his predecessors in behalf of surgery, which, by his own account, he found in a most deplorable condition; and he is chiefly distinguished as a surgical writer. Cauteries and caustics seem to have been his favourite remedies; and he becomes enraptured when speaking of the "divine and secret virtues" of fire surgically employed. The actual cautery he looked upon with veneration, and describes more than fifty affections in which his experience had found it beneficial. He is minute in his directions for its application, and forbids its use, "except by persons acquainted with the anatomy of the frame, and the position of the *nerves, tendons, veins, and arteries*;" from which latter circumstance some idea may be formed of the extent to which he himself was in the habit of roasting his unfortunate patients. He checked arterial hæmorrhage by his favourite method of cauterization, but also employed styptics, as well as complete division of the vessel, and ligature. He is supposed to have been the first to remark, that it is by the formation of a coagulum in the orifice of an artery that its calibre is closed and hæmorrhage arrested. He has described a particular instrument of his own for the cure of fistula lachrymalis, and the needle used by the surgeons of Irak for cataract. He speaks of operating for the relief of hydrocephalus, but the success of the practice does not seem to have been greater than in its revival in our own time; for he confesses that he knew of but one successful case, and therefore does not recommend the operation. He seems to have been conversant with the mode of removing tumours by ligature when the knife is inexpedient; he advises amputation in gangrene of the extremities; and is the first who has described the mode of extracting calculus by incision in the female. His method of lithotomy resembled that practised by Paulus Ægineta; and, like him, he seems to have been bold in puncturing and excising the tonsils, removing the uvula when obstinately relaxed, and extracting polypous tumours from the fauces. He mentions bronchocele as occurring most frequently among women; but, fond of the knife and cautery as he was, he does not seem to have employed either for the removal of that tumour; indeed he tells us of "an ignorant operator who," in attempting extirpation of a bronchocele, "by wounding the arteries of the neck, killed the patient upon the spot." He invented the probang, for dislodging foreign bodies from the gullet; and in wounds of the intestines practised union of the divided parts by suture more than once with success. Though thus bold in his operations, and, like all the Arabians, too fond of the employment of instruments, he was not however without judgment and caution. For example, he condemns tracheotomy as worse than useless when the inflammatory affection of the windpipe is acute, and has extended to the bronchi; an opinion which is acknowledged as true, though unfortunately not always followed in the present day. And he exceeds even Rhazes in his dislike to operative interference with cancerous tumours, declaring that he never either cured, or saw cured, a single instance of that disease; a conclusion too nearly consistent with the history of that most implacable malady in all succeeding ages. His remarks on abscesses are most judicious; directing particular attention to their situation, and recommending their being early opened, whether "matured" or not, when in the neighbourhood of joints or other important parts, which would be injured by their continuance; a rule of practice which, if more faithfully followed, would materially diminish the number of diseased joints and bones. He also advised what has since been so much insisted on by Mr Abernethy, that when the abscess is very large, its contents should be evacuated by degrees. He is the only one among the ancient writers on surgery who has described the instruments used in each particular operation. Avenzoar, a Spanish Arab, practised physic with distinction, about the beginning

**Surgery.** of the twelfth century, at Seville in Andalusia. He describes inflammation and abscess of the mediastinum, from which he had himself suffered; and mentions a case of abscess of the kidney, from which fourteen pints of matter were evacuated. He speaks of bronchotomy as expedient in dangerous cases of inflammation of the tonsils: and in stricture of the gullet proposes three modes of treatment; the occasional passage of a tin or silver tube; the use of a milk bath, that nutritious particles may be taken up by the pores on the skin; and the injection of nutritious fluids by the rectum. He also details cases of "rupture, fracture of the hip-bone, wounds of the arteries and veins, tumours, and other varieties of surgical disease, which he appears to have understood well, and treated with discretion." He does not complain, like Rhazes, that lithotomy was in the hands of mountebanks, but tells us that the Arabians then reckoned such operations "filthy and abominable, and unfit for any man of character to perform;" and held that "no religious man, according to the law, ought so much as to view the genitals." The brightest name in the history of Arabian philosophy is that of Averrhoes, the pupil of Avenzoar, born at Cordova about the middle of the twelfth century, and said to have died in the year 1206. But he cultivated the study of medicine only as a branch of general philosophy, and surgery he seems to have altogether neglected.

Averrhoes,  
A. D. 1206.

Such were the Arabians. Of these, Albucasis was the most famous in surgery, as Celsus had been among the Romans, and Paulus Ægineta among the Greeks. But even he could not escape the unfortunate failing of the Saracenic school; endless invention of manifold and complicated instruments, attaching far too much importance to the mechanical part of their profession, and mistaking the inspiration of terror and infliction of cruelty for energetic and judicious surgery. In order, for example, to arrest hæmorrhage from a wounded surface, if time pressed and assistants were scarce, it was not uncommon to dip the part into boiling pitch, a liquid which was then dignified with the appellation of a styptic. They however systematically divided physic, surgery, and pharmacy into three distinct professions; and so, by commencing the division of labour, may be considered as having done something not unimportant towards the ultimate advancement of medical knowledge. "The last traces of their intellectual illumination appeared among the Spanish Moors in the thirteenth century, when the Christian arms having become more and more powerful, they were compelled to substitute the field for the study—the sword for the pen—and, before an overwhelming opposition, were at length driven from a region whose fields they had tilled, and whose olives they had gathered, for a thousand years. With the decline of the Saracenic school, the daylight of science went down over the nations; and an intellectual darkness, which endured for three hundred years, enveloped the general face of society. All the fountains of science were dried up, and the world seemed retrograding into the unilluminated chaos of ignorance."<sup>1</sup>

School of  
Salerno.

A knowledge of the Greek and Arabian systems of medicine was introduced into Italy, at Salerno, in the begin-

ning of the eleventh century; and this school soon rose to celebrity as a seat of medical learning. In the time of the Crusades, Salerno was a place of great resort for warriors of all nations passing between Europe and Palestine; and by these wanderers, on their return, the light of medical science was thence slowly conveyed over Europe. It obtained the privileges of a university; but the medical school of Salerno did not long retain its high reputation. In modern times, it is chiefly remembered on account of the *Regimen Sanitatis Salernitanum*, a singular production, of which more than one hundred and sixty editions are known to have been published. Though written in the name of the *Schola Salernitana*, it has generally been ascribed to Joannes de Milano. The English king to whom it is addressed is supposed to have been Robert of Normandy, whose claims to the English crown were recognised by some of his contemporaries. The poem opens with these lines:

Anglorum Regi scripsit Schola tota Salerni.  
Si vis incolumem, si vis te reddere sanum,  
Curas tolle graves, irasci crede profanum,  
Parce mero, cœnato parum, non sit tibi vanum  
Surgere post epulas, somnum fuge meridianum,  
Non mictum retine, nec comprime fortiter anum.<sup>2</sup>

In the twelfth century, the Jews practised medicine, not only among their own tribes, but also among the Moors and Christians; and though, like all others of this age, merely treading in the beaten track of the Greeks and Arabians, yet, from their superiority in such learning, they came to be reputed the most skilful practitioners. About the middle of that century, as has already been stated, surgery was completely separated from physic, by the edict of the Council of Tours prohibiting the clergy,<sup>3</sup> who then shared with the Jews the practice of the healing art in Christian Europe, from in any way causing the effusion of blood, at least as a means of curing bodily ailment. Surgery was in consequence abandoned to the uneducated laity, and sunk to a deplorable state of prostration; it became a mere matter of plasters and unguents; and if any thing happened to be written on the subject, it was but a bad compilation from the Arabians.<sup>4</sup> We shall however notice some of the more remarkable events in connection with it during its temporary abasement. In the year 1271, the foundation of the College of Surgeons at Paris was laid by Pitard, a surgeon of eminence in those days, and whose enthusiasm effected something towards raising his humbled profession. About the same time lived Gulielmus de Saliceto, a professor at Verona, said to have been "a powerful man" in both surgery and medicine. He seems to have earnestly dissuaded men from the copying and study of books in preference to practical experience, and he himself set a better example. In our own country Gilbertus Anglicanus is the first name connected with surgery; but he seems to have been little more than a compiler from the Arabians. He lived about the beginning of the fourteenth century; and shortly after him appeared John of Gaddesden, author of the *Rosa Anglica*, and said to have been an erudite and ingenious man, as well as a skilful practi-

A. D. 1271.

Fourteenth  
century.

<sup>1</sup> Moir's Outlines of the Ancient History of Medicine. Edinb. 1831, 16to. Of this work we have not scrupled to make free use in the course of the preceding observations.

<sup>2</sup> *Regimen Sanitatis Salernitanum*: a Poem on the Preservation of Health, in rhyming Latin verse, addressed by the School of Salerno to Robert of Normandy, son of William the Conqueror, with an ancient translation; and an introduction and notes by Sir Alexander Croke, D.C.L. and F.A.S. Oxford, 1830, 12mo.

<sup>3</sup> The early clergy claimed the practice of medicine as their peculiar privilege, and, using it chiefly as a means of personal power and gain, disgraced it by ignorance, charlatany, and imposture. It was to check this that the Roman council assembled by Pope Innocent II. in 1139, threatened with the severest penalties those monks and canons who applied to the practice of medicine, "neglecting the sacred objects of their own profession, and holding out the delusive hope of health in exchange for ungodly lucre." But even this, though followed by the more peremptory edict at Tours in 1163, where Alexander III. presided, did not make them altogether forego what they found so convenient and profitable. It was necessary to repeat the edict in 1179 and 1216; but notwithstanding, the monks continued still to practise physic, and it was chiefly by their evil influence that the school of Salerno was brought to decay.

<sup>4</sup> The writers of that age were aptly termed by Severinus, Arabistæ.

**Surgery.** tioner. About the middle of the fourteenth century, Guy de Chauliac practised with renown at Avignon, and is "accounted one of the revivers of the languishing art." In his *Chirurgia*, a history of the state of surgery in his day,<sup>1</sup> we find the first mention of the Cæsean operation. Contemporary with him was John of Ardern, an English surgeon. He wrote with simplicity and honesty, and may be regarded as a reviver of surgery in that country. In his practice he was peculiarly successful in the treatment of fistula in ano, and thereby acquired a great reputation. Valesco de Taranta, a Portuguese, practised at Montpellier, and wrote on surgery in the beginning of the fifteenth century. He was the first who proposed the cure of cancer by the application of arsenic. About the middle of the same century, lithotomy, the practice of which had hitherto been confined to itinerant and ill-informed operators, was restored to the regular profession by Germain Colot, a French surgeon, high in favour with Louis the Eleventh. He first contrived to witness the operation by the itinerants, then practised it on the dead body, and at last performed it successfully on a condemned criminal who happened to be afflicted with stone, and who consented to undergo the operation on condition of being pardoned if he survived. His success, in having thus doubly saved life, obtained for Colot much renown; and lithotomy ever after continued a regular part of surgical practice.<sup>2</sup> The fifteenth century contains other two events important to surgery; the discovery of the art of printing, about the year 1450, which gave a new impulse to science and literature, by rendering the accumulated stores of knowledge more accessible; and the importation of the venereal disease from America, by the first discoverers of that continent, giving the *small pox* as if in exchange, about the year 1492.<sup>3</sup> In this century also the Turks captured Constantinople, thus overthrowing the last remains of the eastern empire; and by the multitude of Christians who fled from that city many manuscripts of the Greek medical writers were brought to Italy, and their contents thence slowly disseminated over Europe.

Hitherto surgery can scarcely lay claim to an actual revival. Occasional attempts had been made to raise it from its low position, but all proved abortive. At length, however, in the beginning of the sixteenth century, the practitioners of the healing art were happily convinced that the observation of nature was superior to compilation from the ancients, whether Arabian, Roman, or Greek; they consequently ceased to tread blindly and servilely in the footsteps of their predecessors, and a new era arose to the profession. About the same time Vesalius gave birth to anatomy, properly so called;<sup>4</sup> illuminated by which science, surgery became a worthy object of pursuit to men of talents and education, and under their cultivation it was gradually raised to an enlightened and liberal profession.

The most conspicuous name in this new era of surgery is that of Ambrose Paré, a Frenchman. In this country surgery was then sadly depressed, having retrograded since the time of John of Ardern. Its list of practitioners comprised barbers, farriers, sow-gelders, cobblers, and tinkers; and it is not matter of surprise that from among these no name has been handed down as worthy of remembrance. The combination of the practice of surgery with the more harmless manipulations of the barber, was not confined however to this island, but existed also in France, and continued in both countries for upwards of 200 years. The great Paré does not reject the appellation of barber-surgeon, as applied to himself; nor does he seem to think that there is any thing derogatory in the title. He was surgeon successively to Henry the Second, Francis the Second, Charles the Ninth, and Henry the Third, of France; and followed the French armies in all their campaigns down to the battle of Moncontour in 1569. His consequent experience of gunshot and other wounds, on the field of battle, naturally directed his attention to the subject of hæmorrhage; and it is to him that we owe the revival and improvement of the method of arresting bleeding from arteries by ligature, and discontinuance of the cauteries and styptics, which, to the disgrace of surgery, had hitherto been in exclusive use for this purpose. Yet so averse are mankind to abandon their ancient customs, that the improvement of Paré was not sanctioned till after much abuse and persecution, directed both against himself and his discovery; indeed so bitter and unrelenting were his jealous brethren, that he was compelled for his own safety to adduce garbled and incorrect extracts from Galen and other ancients, in proof that to them, and not to him, the invention was to be referred. So far he was less in error than he himself supposed, for we have already stated that he has merely the merit of reviving the use of the ligature.<sup>5</sup> Celsus distinctly advises its employment when pressure fails to stop arterial hæmorrhage; and Albucasis sometimes condescended to use it instead of his favourite cautery and cruel styptics. Paré, however, was amply repaid by future fame for the opposition which he had at first sustained. He rose to an unparalleled height of popularity with the army, by whom he was absolutely adored. On one occasion, his mere presence among the garrison of a beleagured city about to capitulate, re-animated the troops to such an extent, that their resistance became more energetic than before, and the besieging army perished beneath the walls. By his sovereigns he was also highly esteemed. From the general massacre on the fearful night of St Bartholomew he was rescued by the personal exertions of Charles the Ninth, his great merits being appreciated even by that weak and cruel monarch. But he was not content with the respect and praise of his contemporaries; his writings, the result of great experience and accurate observation, freed from the

**Surgery.**  
A. Paré.

<sup>1</sup> Some idea may be formed of the languishing state of surgery at this time, from his division of the surgeons into the following five sects. The first applied cataplasms indiscriminately to every description of ulcer and wound. The second in similar cases employed wine only. The third used emollient ointments and plasters. The fourth, chiefly military surgeons, promiscuously employed oils, wool, potions, and charms. The fifth, "consisting of ignorant practitioners and silly women, had recourse upon all occasions to the saints, praised each other's writings perpetually, and followed each other in one undeviating track, like cranes."

<sup>2</sup> In the beginning of the sixteenth century, cutting upon the staff was introduced by Johannes de Romanis and Marianus Sanctus, and very successfully followed by Laurence Colot, a descendant of Germain.

<sup>3</sup> The first author who clearly describes the venereal disease is Marcellus Cumanus, who wrote in 1495. It was not till 1530 that Fracastorius wrote his celebrated poem *De Morbo Gallico*, in reference to which it has been said that the chaste and classic elegance of its language was worthy of the best days of imperial Rome, and the mellifluence of its versification hardly surpassed by the hard of Mantua himself. By G. Torella, physician to Pope Alexander the Sixth, we are informed that the insane abuse of mercury as a means of cure was not quite a universal practice on the outbreak of the disease; for, in describing some particular forms of mercurial ointment, he himself states that "they destroyed an infinite number of people, who in this case did not die, but were downright killed; and these hold empirics must give an account, if not in this, in the next world, of their practice, and be drowned in the pit of repentance." It is but very lately that the "pit of repentance" ceased to be useful under very similar circumstances.

<sup>4</sup> A little later in the century, Fallopius taught anatomy at Pisa, and Eustachius at Rome, and to their efforts, as well as to those of Vesalius, the advancement of that science is much indebted. Fallopius died in 1563; Eustachius in 1574.

<sup>5</sup> As an example of how little the hint of Celsus was attended to, we may mention, that Procopius relates how Artahazes perished of a wound in the neck, "the artery of the neck having been cut through, so that the blood could not be stopped." Their cauteries and styptics had no effect on the carotid, or its larger trunks.

- Surgery.** yoke of authority, and digested by genius of a high order, have rendered him immortal. His works, first published in 1535, and afterwards more fully in 1582, exerted a most powerful and beneficial influence upon his profession. The influence was not however immediate; for at his death the light he had shed was for a time obscured, surgery reverting to the state of degradation in which he found it, in consequence of its baneful association with barberism. Pigrai was his successor, but an unworthy one: endeavouring to follow the footsteps of his master, he obscured and almost effaced them. The most interesting of Paré's surgical treatises is that on gunshot wounds, a class of injuries then of recent introduction, and little understood: the murderous cannon and firelock had not long been in use.
- Seventeenth century.** In the seventeenth century surgery again revived, resuming the impulse which the genius of Paré had imparted. Italy produced Cæsar Magatus, who simplified, and consequently must have improved, the treatment of wounds; the never-to-be-forgotten Tagliacotius, with his rude repairs of the human face; and Marcus Aurelius Severinus, a skilful and intrepid operator. At the end of the sixteenth and beginning of the seventeenth centuries, Padua was favoured with Fabricius ab Aquapendente, the preceptor of Harvey, a most distinguished physiologist, and the most eminent surgeon of his time. His *Opera Chirurgica* passed through no less than seventeen editions, and contain not only an excellent digest of surgery as it then was, but also many improvements of his own. About the middle of the seventeenth century arose the true father of British surgery, our own Wiseman, the Paré of England. One or two English names are to be found before him: William Clowes, a military surgeon of some eminence, attended the Earl of Leicester's army in the Low Countries, and wrote on gunshot wounds; and Lowe, a Scotchman, gave to the world a Discourse on the whole Art of Chirurgery, dated 1612: but Wiseman doubtless is the first Briton worthy of note in surgery. He was serjeant-surgeon to Charles II., and amidst the horrors of the civil wars had ample scope for the study of his profession. His surgical works, consisting of eight treatises, dated 1676, contain much information, at that time most valuable, and still amply rewarding an attentive perusal. In military practice he strongly advocated immediate amputation, "while the patient is free of fever," in the case of such injuries as rendered preservation of the member improbable, of course allowing the primary shock of the accident to be past; a point of practice which long discussion in after years served to confirm. It was not till his time that surgeons ceased to believe that gunshot wounds were necessarily envenomed by the powder and ball, and had to be treated accordingly with potent and cruel dressings. The immortal Harvey, contemporary with Wiseman, cannot perhaps be classed among the eminent surgeons, having principally confined himself to anatomy and physiology, yet he is inseparably connected with that science by his discovery of the circulation of the blood; a discovery which has done so much for the advancement of all medical knowledge, but of surgery in particular.
- Harvey.** James Young, a surgeon in Plymouth, may be said to have been also contemporary with Wiseman, having written in 1679. He is the first who proposed amputation by a flap, an improvement to which two French surgeons, Verduin and Sabaurin, lay claim; and he is also the first who recommends limited compression of the main artery in amputation.
- A. D. 1628.** Germany boasts of several eminent surgeons of this time; Fabricius Hildanus, a most successful practitioner, and author of a surgical treatise dated 1641; Scultetus, author of the work, celebrated for its horrid array of lethal weapons, called *Armamentarium Chirurgicum*, 1653; and Purmann, who displayed too great an attachment to the dangerous representations of Scultetus. Heister, a professor in the university of Helmstädt, wrote a system of surgery, which has been translated into most of the European languages, and is still in high repute.
- Surgery.** Holland likewise possessed successful practitioners of surgery, but tainted with an unworthy concealment of their methods of cure. Rau, a native of Germany, though a professor at Leyden, was perhaps the most successful lithotomist that ever lived, but he kept his method of operating a profound secret, and made it a mystery even to his own pupils; as appears from the circumstance that his two favourites, Heister and Albinus, of a more liberal spirit than their master, in attempting to divulge his secret for the benefit of the profession at large, have varied most materially in their statements. This illiberal spirit pervaded the other branches of medicine as well as the surgical. The famous anatomist Ruysch preserved inviolate the secret of his wonderfully minute injections, although really the discovery of his friend De Graaf; and Roonhuysen the accoucheur worked stealthily with his invented lever. The succeeding generation however removed this stigma from the Dutch; and their great Camper was equally celebrated for the number of his discoveries and the zeal with which he made them known.
- From the time of Paré, France produced no surgeons of great eminence until the eighteenth century. In the seventeenth, we find the names of Dionis, Belloste, Saviard, Dionis, and a few others of some renown, but not at all equal to their contemporaries in other nations. Some idea may be formed of the then feeble condition of surgery in France, from the fact, that Louis XIV. was not cured of a simple fistula in ano, until after his life had been in no small degree endangered by repeated abortive operations. That the French can boast of surgeons of the first class in the eighteenth century, next century, however, is indisputably shown by the simple mention of Petit and Desault; names that must ever occupy a proud place in the annals of surgery. The former, adding to the most powerful talents great industry, and an innate love of his pursuits, rose rapidly to eminence, though not without much envious opposition, which seems to be the portion of nearly all those who occupy a pre-eminent place in the profession. On general surgery, he has left a work of much value; and his treatise on diseases of the bones, though produced at an early age, entitles him to be called the father of that branch of pathology. For many years it remained the best work on the subject. He was the inventor of the screw-tourniquet, and the first who operated for fistula lachrymalis by transfixion of the sac. He contributed largely to the Memoirs of the Royal Academy of Surgery; an institution which has done much for the advancement of surgery, not only in France, but throughout the world. Its Memoirs, containing the result of the labours of many eminent men, constitute a work of the greatest value. Desault, also of high reputation, both as an anatomist and as a surgeon, was the first who taught surgical anatomy, and gave clinical lectures on surgery. His improvements on the apparatus for fractures were most important; and a splint invented by him is still in use for fractures high in the femur. His modifications of cutting instruments were also good; among others, changing the amputating instrument to a straight knife, instead of the old curved weapon. He was the first who contemplated the cure of artificial anus, resulting from strangulated hernia; and he further improved Paré's revival of ligature of the arteries. The proposal of curing aneurism by ligature of the vessel on the distal side of the tumour originated with him; a proceeding, however, of which the merit is still dubious. His writings are both valuable and extensive. After the great names of Petit and Desault, not a few French surgeons of the same century, though less eminent, yet deserve mention; Le Dran, a copious and excellent author; Le Dran, Sabatier, famous in the department of operative surgery; &c.

**Surgery.** Garengot, Louis, La Motte, Frère St Cosme,<sup>1</sup> Portal, Pouteau, Lecat, Chopart, Morand, Moreau, &c.

**America.** It is about the middle of the eighteenth century that our attention is first attracted to our transatlantic brethren. In 1763, lectures on anatomy and surgery were delivered in Philadelphia by Dr Shippen; and in 1791 the medical school of that city was completely established, under Benjamin Rush, the Hippocrates of Colombia; a school which has since lent invaluable aid to the progress of both medicine and surgery.

**Pott.** Our own country was at this time by no means barren in surgery. Percival Pott and John Hunter are names which occur, the one in the middle, the other in the end, of the eighteenth century, and are fully equivalent to Petit and Desault; indeed Hunter may be justly ranked as the greatest man that ever graced the profession. Pott, the best author, operator, and practical surgeon of his time, greatly improved the practice of surgery in England, both by his writings and by personal example. Like Desault, his attention was particularly directed to the treatment of fractures, of which he had some painful experience in his own person, having sustained a severe compound fracture of the leg. He has left a justly celebrated treatise on the subject. On amputation his observations are most important, clearly discriminating between those cases, of injury more particularly, which demand the operation, and those which do not; at the same time marking the period most advantageous to its performance. Regarding injuries of the head, he wrote with more precision, and at the same time with more originality, than any previous author, and will ever remain a valued authority upon that subject. The same may be said of his description of vertebral disease, he having been the first who clearly distinguished between those curvatures of the spine depending on mere change of form in the bones, and those occasioned by caries or abscess: the latter formidable affection is still known as "Pott's disease" of the vertebræ. He greatly improved the treatment of fistula in ano, and abscesses in general; and by simplifying the whole art of surgery, discarding the cautery and escharotic unguents, or rather limiting them to their proper place and use, employing also the cutting instruments with caution and reserve, and placing more implicit trust in, and showing more respect for, the powers of nature than had hitherto been the custom, he achieved a most important and beneficial reform in surgery. Until his time, the maxim "Dolor medicina doloris" remained unrefuted. The actual cautery, for example, was in such general use, that "at the time when surgeons visited the hospital, it was regularly heated and prepared in the wards, and in the presence of the patients, as a part of the necessary apparatus. Mr Pott lived to see these remains of barbarism set aside, and a more humane and rational plan, of which he was the originator, universally adopted." John Hunter, a native of Scotland, the pupil, first of Cheselden, and afterwards of Pott, though not remarkably distinguished as an operator, was the most gifted surgeon of which the medical profession can boast, and no less eminent as an anatomist, physiologist, and general philosopher. His researches comprehended a wider range than those of Pott, but arrived at the same end, the improvement of surgery. The knowledge obtained by his vast inquiries into physiology, pathology, and human and comparative anatomy, was, with all the power of his genius, brought to bear upon the practice of

**Surgery.** the profession, and with the happiest success. The doctrines of adhesion, granulation, ulceration, and inflammation with its various results, were, until detected and explained by him, comparatively obscure and uncertain; and no one is ignorant how much the successful treatment of disease, either by surgery or medicine, must ever depend on an accurate and familiar knowledge of these rudiments. To him we are indebted for the simplification of more than one operation, the discovery of the vitality of the blood, important advice as to the treatment of gunshot wounds, the enforcement of excision of bitten or poisoned parts, many new facts as to the physiology and pathology of teeth, and other valuable additions to practical surgery. But these assume an unimportant place among his deeds, when placed beside the two with which his name is indelibly associated—the cure of popliteal aneurism by ligature of the femoral artery, and the elucidation of the venereal disease; his work on the latter subject still remaining standard, and in many respects unsurpassed. His improvement of the operation for aneurism marks an era in the history of surgery, being one of the most important of its advances. Dissatisfied with the cruel, formidable, and unsatisfactory operation for popliteal aneurism, by incision of the tumour and ligature of the vessel at its diseased part, he made himself aware of the causes of failure by the old system, contemplated the plan of cure which bears his name, satisfied himself of its practicability by diligent study and experiment, successfully brought it to the test of actual practice; and then, extending the principle to all aneurisms, effected for surgery a great triumph over that formidable disease.<sup>2</sup> His first operation was performed in 1785, and was successful; proving that permanent removal of the force of the circulation in the aneurism is sufficient for its cure, by permitting consolidation and ultimate obliteration of the tumour. Since his time the method of applying the ligature has been considerably improved, and the certainty of success consequently increased. But "the more brilliant a discovery, and the more beneficial its results, the more certain is its author of becoming the butt of envy and the object of detraction." And accordingly we find that Hunter has not been permitted to remain in undisturbed possession of his discovery. Its merit has by some been claimed as due to Aëtius; others, with better hopes of success, support the pretensions of Guillemeau (a pupil of Ambrose Paré), Anel,<sup>3</sup> and Desault; but a candid inquiry into facts and dates will ever result in ascribing the honour to our illustrious countryman. Had he even been deprived of this, his name must still have been immortalized by other and more palpable labour of his mind and hand—his books and museum.

In the same century with Pott and Hunter, Britain also produced White, an excellent practical surgeon and lucid White. writer; Cheselden and Douglas, two eminent lithotomists, Cheselden. the former peculiarly successful; Sharp, famed for his *Critical Inquiry into the State of Surgery*; and Monro, a name indissolubly united with the birth and fame of the Edinburgh medical school.<sup>4</sup>

In Italy, where, during the times of Pott and Hunter, several eminent surgeons lived, Lancisi, Morgagni, Bertrandi, Troja, &c.,—the labours of Hunter in aneurism were ably followed up by Scarpa, who still further elucidated the doctrines regarding the new treatment of that disease, and established the success of the operation. He was also eminently successful in his researches as to the anatomy and patho-

<sup>1</sup> Frère Jean de St Cosme, although a monk, had been educated as a surgeon. He was the inventor of the Lithotome Caché, and with it obtained wonderful success and celebrity as a lithotomist.

<sup>2</sup> "So discouraging were the results of the old operation, that many surgeons preferred performing amputation of the aneurismal limb."

<sup>3</sup> Guillemeau and Anel placed their incisions and ligatures in the immediate neighbourhood of the tumour.

<sup>4</sup> Dr Monro was appointed professor of anatomy to the company of surgeons in 1719, and during the ensuing year he was appointed to a similar chair in the university. Several other professors in the same faculty had previously been nominated; Sir Robert Sibbald, Dr Halket, and Dr Pitcairne, so early as the year 1685. But Dr Monro was the first who regularly delivered public courses of lectures, and he may in a great measure be regarded as the founder of the medical school of Edinburgh.

**Surgery.** logy of hernia, a subject which he has made peculiarly his own. The same century saw in Germany, Schmucker, Richter, and the great Haller, whose *Disputationes Chirurgicæ* bear, equally with his other works, the impress of both labour and genius of a high order.

**Haller.** The nineteenth century will not yield to any former era in a numerous and bright array of names dear to surgery. It has seen the fall of Abernethy and Dupuytren, brilliant stars in the galaxy, and mourns others highly valued; but vast and powerful is the host who are still labouring, with distinguished success, in their noble calling. In all civilized countries, the dark days of the profession have, we trust, for ever passed away; and many are the illustrious names in which it now exults, more particularly in France and Germany. But we hesitate not to assert,—and we cannot think that national prejudice exerts any influence in leading us to the conclusion,—that no country can boast of such a crowd as that by which Britain, in the present century, has been and still is adorned. And we feel an honest pride in stating, that the medical school of Edinburgh can claim connection with not the least among these living names.

**Nineteenth century.** Having followed surgery thus far, from the earliest times, in its most notable points of history, we shall proceed to inquire briefly into the practice of the present day. And, **Abernethy, &c.** first, of the art of operating. It is a favourite phrase by which operations are stigmatized as the “opprobria of surgery.” Nothing can be more unjust. So long as injury and disease are permitted to afflict mankind; so long as bones are crushed, and flesh bruised and torn; so long as tumours grow, and gangrenes spread—and we know nothing short of direct divine interposition that can wholly prevent such accidents—it is only by operation, dexterously executed and skillfully timed, that the human frame can be kept in repair, and life prolonged. To be able safely and expeditiously to remove parts which accident has rendered totally useless, and which would prove highly injurious if longer attached to the body; to take away diseased formations, or other noxious substances, and, at the expense of but brief suffering, to dispel torture which had rendered existence a burden for previous weeks, months, and years; to accomplish such results, though it be by blood and pain, is alike creditable to the operator and beneficial to the sufferer. It is not a disgrace to the profession that certain injuries and diseases are of so grievous a nature as to be incurable but by operation, for such is the dispensation of Providence; it is the surgeon’s boast to have recourse to the knife as seldom as possible; but it is also his pride to be able by it, as a last, and, to both parties, painful resource, to ward off suffering, deformity, and death. It is not, to operate, but to operate unseasonably, unnecessarily, unskillfully, that can ever bring disgrace; and to refrain from performing an operation when it is loudly and plainly called for, would carry not only opprobrium to surgery, but guilt and shame to the surgeon. We are speaking of surgery as it now is, not as it was. In former times operations were its disgrace. Knives, hot irons, screws, files, and saws, were employed with cruel and ignorant recklessness; but of late years, it has been the object of each truly good surgeon to simplify and diminish the number of instruments, and at the same time to use them as seldom as possible. He does not hesitate to employ them when his knowledge and experience tell him they have become indispensable. On the contrary, he will probably be urgent in their application, knowing that an early wound may save much after-suffering; but, in the first place, he will exert all his skill and all his powers, by

**Surgery.** milder measures to counteract injury and restrain disease, so as to supersede the necessity of operating. To effect this is doubtless the true triumph of his profession; and this triumph he often attains. But he must be Utopian indeed who can seriously hope that the period will ever arrive when operations shall have altogether ceased to be required. In the progress of surgery, many a murderous weapon, at one time in frequent use, has grown thick with rust, and become almost unknown; those retained are few, effective, and never employed without good cause. The growth of science and experience is bringing the ravages of disease more and more under control; operations are not only less frequent, but more simple and less dangerous in the performance; and it is the pride of the modern surgeon to witness and promote this great improvement of his profession. But there arc, and ever must be, diseases which we cannot expect to cure, and injuries against which we cannot hope to strive successfully, so as to preserve life, by any measure short of operation. Modern surgery, accordingly, while anxious to limit the necessities for operation, is not the less aware of its importance as a means of cure; and has not only directed attention towards its improvement, but also extended its application, and with the happiest result, to diseases formerly unopposed. Many patients, for example, are now by the knife freed from morbid growths and natural deficiencies, who were formerly left an unprotected prey to deformity and disease.

The necessity for an operation having been clearly established, our object then is to perform it as safely and expeditiously as possible. We now no longer hear, as we did even so lately as fifteen or twenty years ago, of a poor patient being tortured for the space of an hour, by cruelties misnamed lithotomy: in a few minutes the bladder is cleared of extraneous matter; and almost the like number of seconds will suffice for amputation.<sup>1</sup> With this celerity, the safety of the patient is not only equally, but more secure; for rapidity is still held subservient to, though conjoined with, excellence of performance; and the mere absence of protracted pain confers a most important advantage on the reparative powers of the system. A prominent cause of this improvement in the art of operating, is an increased simplicity of the instruments, their arrangement, and use. On this subject, one who is *facile princeps* among the operators of the present day,<sup>2</sup> observes: Our armamentaria should contain simple and efficient instruments only; the springs, grooves, notches, and curves, seeming to be chiefly intended to compensate for want of tact and manual dexterity. The apparatus, though simple, ought to be in good order, and should always be placed within easy and convenient reach of the operator, so that he may be in a great measure independent of the lookers-on, who, owing to anxiety or curiosity, hurry and agitation, are apt to hand any thing but what may at the instant be required. He will consider well what place he himself will most conveniently occupy during the operation; and having obtained proper assistants, he will make sure that they all understand what is expected of them. In short, before he ventures to begin, he will ascertain that every thing is arranged, and in proper order; more particularly, that the cutting instruments have good points, that their edges are keen, and that the joints of forceps and scissors move freely and readily. The principle on which the instrument is made to cut should be well considered. Every knife is to be looked upon as a fine saw; the teeth of some are set forwards, and these cut best from point to heel, as does a razor; but the greater number are set in the opposite direction,—for example, the com-

<sup>1</sup> Nor are there many now, who, alluding to their operative powers, would be likely to express themselves as did the preceptor of the immortal Harvey, first surgeon of his time though he was: “If it be a moveable tumour, I cut it away with a red-hot knife, that sears as it cuts; but if it be adherent to the chest, I cut it without bleeding, with a wooden or horn knife, soaked in aquafortis, with which, having cut the skin, I dig out the rest with my fingers!”  
<sup>2</sup> Mr Liston.

**Surgery.** mon scalpel and bistoury,—and act efficiently only in being drawn from heel to point. The cutaneous tissues, and in many instances the subjacent parts, should be divided at once and completely, by a single incision made lightly and rapidly; for the pain experienced is in proportion to the pressure and tardiness of movement in the instrument applied. The pain of partial division of the skin, in tails left at each end of an incision, is very great; and, besides, such wounds are not so available, as they would otherwise be, for the intended purpose of evacuating fluid, for permitting the extraction of foreign bodies, or for the dissection of morbid growths. Also, the pausing of a surgeon in the midst of a dissection, and the resort to fresh and more extensive incisions of the surface, is not only always awkward, but attended with much additional and unnecessary pain to the patient. Every cutting instrument should be well balanced, and placed in a steady, smooth handle; the point should either be in a line with the back, which ought then to be perfectly straight, or both edge and back should be so far convex, the point being in the middle of the blade. The form and size of the instrument ought always to be in proportion to the extent of the proposed incisions, both as regards their length and depth: nothing can be imagined more cruel and reprehensible, for example, than an attempt to remove the lower extremity of a full-grown person with a common scalpel or dissecting knife. If an extensive incision is necessary, an instrument should be employed possessing length of edge sufficient to separate the parts smoothly and quickly. Should the operator be required to cut on important parts, to perform a delicate dissection of the living tissues, he will choose a short-bladed instrument, with a handle rather long and well rounded; and after the superficial incisions have been effected, he will hold it as he would a writing pen, lightly but firmly, so that he can turn the edge, and cut either towards or from himself, as occasion may require. A small well-made scalpel, with a good point, and less convexity than those usually employed, is the instrument best adapted for such a purpose. Grooved probes and directors should be used as little as possible. With a little practice, incisions may be made upon the most delicate parts, without risk, by the hand unsupported, one layer being cut after the other. If any instrument is wanted to make the proceeding more safe—if the closely investing fasciæ of a hernial tumour, for example, are to be cautiously raised—dissecting forceps will be found the most convenient instrument for elevation previous to incision. In dividing the skin, the knife, whether a scalpel or a bistoury, is to be held and entered with the point and blade at right angles to the surface. It is carried with a decisive movement down to the subcutaneous cellular tissue; the blade is then inclined towards the part to be divided, and by a rapid and slightly sawing motion—as little pressure being applied as possible—the division is effected to the desired extent. The incision is finished by withdrawing the knife in a position perpendicular to the surface, so as to divide the entire thickness of the skin at the extremity as well as origin of the wound. For dexterously effecting such manipulations, the “fingers must be educated;” and diligent practice in the dissecting-room will be found the best foundation for surgical dexterity, as it is for sound surgical knowledge: “it is only when we have acquired dexterity on the dead subject, that we can be justified in interfering with the living.” By practice the pupil will be enabled to use either hand almost equally well, and none should neglect to attain this power, for an ambidexterous surgeon possesses

a great advantage as an operator. An ordinary degree of expertness is within the reach of any one who will industriously seek for and improve the opportunities for its acquirement; but yet a certain combination of natural qualifications is undoubtedly necessary to the attainment of pre-eminence in operative surgery; for a great operator in one respect resembles a great poet,—“*nascitur, non fit.*” The importance of these natural gifts did not escape Celsus. “He must be young, or at most but middle aged,” says he, “and have a strong steady hand, never subject to tremble. He must be ambidexterous, and of a quick, clear sight. He must be bold, and so far void of pity that he may have in view only the cure of him whom he has taken in hand, and not, in compassion to cries, either make more haste than the case requires, or cut less than is necessary, but do all as if he were not moved by the shrieks of his patient.” The coolness and courage thus inculcated are the most valuable natural gifts of the surgeon; and it would be well did every patient remember that they are equally important in himself, for on his steadiness and patience under suffering much of the celerity and success of an operation depends. Expert skill in operation contributes greatly towards perfect self-possession; for the dexterous surgeon, like an adroit master of the sword, “will not enter rashly into difficulties, but being engaged from necessity or conviction, will bring himself through with courage.” He who has what is strangely termed “*common sense*,” enjoys another of nature’s choicest gifts; and to no possessor does it prove more valuable than to the surgeon, as by its judicious application the want of more than one of the prominent qualifications considered as essential to his success may be fully compensated.<sup>1</sup> But a combination of the natural essentials for an eminent operator, as may readily be imagined, falls to the lot of only a small number; and to that gifted few it were well, when circumstances will admit of it, to delegate the performance of the more dangerous and difficult operations. Every surgeon, however, should be ready to undertake the greater number of surgical proceedings without hesitation or delay; for though, as we have already stated, operations do not form the most important part of surgery, they still are, and ever must be, inseparable from its successful practice.

Hæmorrhage, the most prominent accompaniment of hæmorrhage. surgical operation, is now in much better command, both temporarily and permanently, than it used to be, and consequently is less dreaded by the surgeon. During the operation, complicated machines, encircling the whole limb—very painful from the great and general pressure, and increasing the loss of blood by swelling the venous torrents and retarding retraction of the minor vessels—are now superseded by the skilful application of the “educated” and steady hand of an assistant, compressing the trunk of the main artery, and it alone. This change is particularly advantageous to amputation, admitting of its performance with greater despatch, less hæmorrhage, and less pain. In more tedious proceedings, the cautious extirpation of tumours, for example, the surgeon commences his incisions where he knows the principal vessels enter the part about to be the scene of operation: they are consequently divided at once; an active and steady assistant secures their orifices by the pressure of one or more fingers, and the proceedings are completed with comparatively little loss of blood, and without the hindrance of applying ligatures to any arterial branches until all the knife-work has been completed. Sometimes, when the part is unusually vas-

<sup>1</sup> The ancient Athenians had a law, that no slave or woman should study medicine; probably fearing want of education in the one class, and deficiency of common sense in the other. Perhaps it were well if a similar protection to the practice of the profession were in present force, as was proposed by the late Mr Alexander Wood of this city. In addition to the usual examination for the diploma of surgeon, he wished to establish a jury to determine on the common sense of the candidate, stating as his reason, “If they have not *that*, I would not give a — for the rest of their medical knowledge.”

Surgery.

cular, and important vessels come from all sides, this rule cannot be followed, and ligature must be applied to each important branch as it is divided; but this necessity for delay does not often occur. The ligature,—a firm hempen thread, well waxed,—ought in all cases to be applied very carefully, and made to enclose the orifice of the artery alone, which for this purpose is pulled out by common well-pointed dissecting forceps, or, when the parts have been consolidated by infiltration, by a sharp tenaculum. A double knot, carefully secure, having been made upon the isolated orifice, one end of the ligature is cut off close to the knot, the other being left protruding from the most dependent part of the wound, that the ultimate separation of the ligature and its enclosed slough may thus be watched and made certain. It was lately recommended, and is still practised by some, to cut away both ends of the ligature close to the knot, in the belief that the union of the wound by the first intention would thus be favoured, and in the hope that the noose would become encysted in its original situation, and produce no further annoyance; that hope however has been disappointed. It was then thought, that by making the ligature of an animal substance, as catgut, it might be slowly removed by absorption, and thus be prevented from becoming a source of future irritation; but that plan also failed. No doubt, ligatures in such circumstances have long remained quiescent, but that has been seldom; sooner or later, perhaps after the cure has been thought complete, they occasion the formation of abscess after abscess, and produce much irritation, until they themselves are expelled; and thus recovery is in the end much protracted. The usual practice therefore now is, to leave one end of each ligature a little protruding from the lips of the wound, in order to secure their complete expulsion at the proper period. These remarks of course apply only to wounds which are approximated soon after infliction, with the hope of their adhesion. When the cut surface, on the contrary, is left open, in order to suppurate, both ends of each ligature should be removed close to the knot, the practice being then unexceptionable. Another innovation lately practised, was the substitution of torsion for ligature of the arterial orifice, thereby imitating the natural means of suppressing bleeding. The method has only been found to succeed well with vessels of the second class, such as those of the fore-arm—being inapplicable to the smaller twigs, and not safe in the case of the larger arterial trunks. In every extensive wound, therefore, some ligatures must be applied; and that being the case, it has been found more convenient and satisfactory to apply ligatures to each orifice requiring artificial closure. Hæmorrhage from veins usually ceases spontaneously when the position of the part is attended to, and all pressure removed that might prove an obstacle to the venous return. If it should be found obstinate, pressure applied to the orifice will be sufficient. Under any circumstances, cauteries and caustics are now seldom if ever required for arresting hæmorrhage.

Wounds.

These remarks naturally lead to the consideration of incised wounds, and here we again find that simplicity and improvement in surgery are synonymous. "Hot dressings, filthy unguents, greasy poultices, stimulating plasters, and complicated bandages, have given place to light water-dressing, unirritating plaster sparingly applied, and careful position of the part."<sup>1</sup> To no one does a larger share of merit belong in this, than to him from whom we have made the above quotation; and we cannot do better than continue to glean from him a little more on this subject. "Formerly (and they are even still) wounds were put together without delay, and their edges squeezed into apposition, and retained

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by various means, such as sutures, plasters, compresses, and bandages. They were carefully covered up, and concealed from view for a certain number of days. Then the envelopes of cotton and flannel, the compress-cloths, the pledgets of healing ointment, and plasters, were taken away, loaded with putrid exhalations, and a profusion of bloody, ill-digested, fetid matter. A basin was forthwith held under the injured part, and the exposed and tender surface was deluged with water from a sponge, and then well squeezed and wiped. Then came a re-application of retentive bandage, of the plaster, of the grease mixed with drying powder, all surmounted by some absorbing stuff, as charpie or tow, to soak up the discharge. This was not unaccompanied by pain, often more complained of than that attendant on the original injury or operation. This process was repeated day after day, the patient was kept in a state of constant excitement, and often, worn out by suffering, discharge, and hectic fever, fell a victim to the practice. The wound was, as it were, put into a forcing bed, excited action beyond what was required was hurried on, and the consequence was, that immediate union seldom if ever could or did take place. A suppurating surface, on the contrary, with bad profuse discharge, and a very tedious cure, if any, were obtained." This was an uncomfortable state of matters, but there is now a change. Surfaces are not disposed to unite for many hours after the division and separation have occurred. So long as there is oozing of blood, no good end is to be attained by their close apposition. Should this be attempted, the blood which continues to be discharged from the smaller vessels is necessarily prevented from escaping; and the consequences are, infiltration of the loose cellular tissue, distention of the cavity of the wound, and separation of the surfaces probably throughout their whole extent. Then ensues a congested state of the surrounding vessels, with perhaps a troublesome hæmorrhage from branches that would otherwise have become sealed up; at all events, much constitutional disturbance, a heated swollen state of the injured parts, profuse, bloody, and putrid discharges, must occur; and this will certainly be followed by wasting suppuration from a foul cavity, which will be long in assuming a healthy action. It is only when re-action has occurred, when gentle vascular excitement has taken place in and around the solution of continuity, and when plastic matter begins to be secreted and thrown out, that the process of adhesion can be expected to commence. The edges of a large wound, as that resulting from amputation of the extremities, may be approximated in part, either by position, or by a few points of interrupted suture, as soon as bleeding from the principal vessels has been arrested. But the close apposition, and application of all the retentive means, had better be delayed for six or eight hours at least. In the interval, sensibility will be abated, the oozing moderated, and the chance of secondary hæmorrhage much diminished, by lightly covering the parts with lint dipped in cold water, and frequently renewed; or a piece of lint may be placed between the cut surfaces, and a constant irrigation of them be kept up for some time, by threads passing from a vessel containing cold water. When all oozing has ceased, and the surface become glazed, the surrounding skin, previously shaved, is made thoroughly dry; coagula are removed, the edges are put carefully and neatly in contact, and are retained by narrow slips of adhesive plaster placed at intervals. The plaster commonly in use does not retain its hold sufficiently long, is loosened by discharge, heats the surface, and often gives rise to erythema. A better kind is made by spreading a strong solution of isinglass in spirit on the unglazed side of oiled silk, cut into slips of the necessary length and size;

<sup>1</sup> Liston's Practical Surgery.

**Surgery.** this plaster is quite unirritating, and often retains its hold until the very completion of the cure. Being transparent, it does not prevent any untoward process that may be going on underneath from being observed; and if any fluid collects under it, an opening can be made for its escape. If sutures have been previously employed for the partial approximation of the wound, they can be removed by cutting the thread, shortly after the fixing of the plasters, for these alone are sufficiently retentive. No other dressing need be employed in the first instance; no compress, no pledget, no bandage; for in general they will not promote union of the wound, and may do harm. The slight discharge that oozes out is from time to time wiped from the surrounding skin, and from the glazed cloth on which the part is laid. In some cases of amputation, after a few days a roller may be applied, to encourage the subsidence of any slight œdema that may have arisen, and to bring the stump into a good form. By such simple treatment, a great deal of suffering is saved to the patient, and he enjoys much comfort and cleanliness; besides, the surgeon is relieved from a load of most unpleasant and harassing duty.

Wounds produced accidentally are almost always attended with more or less bruising of the parts, and can be united only by the second intention. After bleeding has been suppressed by the method recommended for incised wounds, the cold applications are to be superseded by those of an agreeable warmth, such as poultice of bread and water, or, what is much to be preferred, from its simplicity and lightness, lint of thick texture, and of sufficient size to cover the wound, soaked in tepid water, and overlaid by an ample piece of oiled silk to prevent evaporation. Heat and moisture, by which qualities a poultice produces its soothing and beneficial effects, by which the surface is relaxed, its capillary circulation encouraged, and discharge promoted, are thus amply afforded, without any of the weight, putrefactive fermentation, stench, and filth, inseparable from the best of common poultices. The edges of the wound are approximated as much as possible by attention to position; and by the same means the return of blood is favoured, and engorgement of the vessels and inflammatory swelling prevented to a very great degree. If the wound run across the fibres of the skin and muscles underneath, these are to be relaxed by flexion or extension, as may be, of the neighbouring articulations. Rest of the injured parts is also essential, and to obtain this it is sometimes proper to apply splints. Contraction of the wound takes place naturally, and generally with sufficient rapidity; should the surface, however, from any cause become weak and flabby, the lint is to be wet with a gently stimulating solution, as of zinc, instead of tepid water. Support, by bandage or plaster, may for a like reason sometimes be required. But healing is often retarded by the plasters and bandages which are inconsiderately employed to hurry it on; the granulations are absorbed, the surface of the sore becomes foul, the discharge thin and offensive, perhaps inflammation of the surrounding skin takes place, with extension of the sore by ulcerative absorption. Sometimes adhesion and suppuration may be happily blended in the cure. Thus, when, in a suppurating wound, whether accidental or incised, the discharge begins to thicken, and diminish in quantity, when the granulations are florid, small, and acuminate, and when the surrounding parts are sufficiently lax to admit of easy approximation, the granulating surfaces may then be brought into close apposition, with every prospect of immediate adhesion taking place.

Under some circumstances, the rule laid down as to the

propriety of delay in permanently closing wounds, may be departed from with advantage; as when the entire surface can be brought into close and accurate apposition, so that no clot of blood can be interposed; as, for instance, in penetrating wounds of the mouth; in division of the lip, as for harelip; and in repairing some deficiencies of the genital organs. In such cases, either the twisted or quilled suture is used, usually the former, and no other dressing should be applied. To put on strips of plaster, to cover the part with lint smeared with ointment, to interpose dossils of lint between the skin and ends of the pins, to support the wound by a uniting bandage—all this is mischievous, and a remnant of the old meddlesome surgery. Any kind of application collects and retains the secretions, heats and excoriates the surface, promotes suppuration, and interferes with the process of union.

Such is an outline of the simple treatment of wounds now employed, with the happy effects of saving the patient from much pain, and the surgeon from much trouble; obtaining a more frequent occurrence of adhesion in incised wounds; shortening the process of suppuration, and depriving it of much of its inconvenience. It is almost needless to observe, that this, as well as every other treatment, will however prove of little avail, unless accompanied with a careful attention to the general health: in other words, the surgeon, not hesitating to encroach thus far upon the duties of the physician, must ever be employing his medical science.

In no class of diseases is the operating knife now more happily in abeyance, in comparison with former practice, than in affections of the joints. Many a limb is now saved, with its usefulness little if at all impaired, that would, in days not long passed, have been doomed at once, and with very little ceremony, to amputation.<sup>1</sup> This important saving of life and limb is mainly attributable to the advance of pathology. The cultivators of that science, among whom the name of Brodie deserves prominent notice, have shown with great perspicuity the various changes which morbid actions induce in the structure of articulations, and established a wonderfully accurate diagnosis of each affection. We can often tell in what tissue of the joint disease originated, of what nature the morbid action is, and can predicate almost with certainty the actual state of the parts, as to extent and manner of degeneration. According to the principle that "the knowledge of a disease is half its cure," great advantage is thus obtained in adopting and regulating the treatment suitable to the circumstances of each case. Besides, we can tell at once, and with tolerable accuracy, in what cases we shall probably succeed; and in those in which we are made aware that the disease is of such a nature, or has proceeded to such an extent, as to baffle all attempts to cure, we are enabled to save valuable time, and thereby to save life, by proceeding at once to the only cure available, amputation. In whatever part of the joint diseased action may have originated,—bone, cartilage, bursæ, or synovial apparatus,—if not arrested, it soon extends to all, converting the whole joint into one mass of disorganization. It is of the utmost consequence, therefore, to be early in the employment of the appropriate means of cure. The first and most important object is to secure absolute want of motion in the diseased parts; and here it is that the greatest improvement has taken place in the treatment of joints. "If perfect repose and quiet of the affected parts be omitted, all other means are found nugatory, and were as well untried. Nothing but disrepute can accrue to the profession, if hot irons, moxas, and issues continue to be used inconsiderately, to the neglect

<sup>1</sup> John Hunter himself seems to have been in the habit of making very unwarrantable abbreviations of living limbs, as the following anecdote abundantly proves. "He once had a patient whose leg he considered it necessary to remove. He had got on his *dress*, and a profound silence reigned in the theatre. The surgery-man disappeared. In two minutes he returned alone, with a face as long as the leg. 'Why do you not bring in the patient?' demanded the expectant operator. 'Because, sir,' said the astonished surgery-man, 'because, sir, he has run away!'" It is to be hoped that the custom of amputating legs that are able to "run away" has fallen into complete desuetude.

**Surgery.** of more powerful and less appalling means. Instant relief invariably follows the securing a state of perfect rest ; other means, local and constitutional, are thus afforded a fair chance of doing good, and the natural efforts towards a cure are no longer thwarted and interrupted. But, above all, the effect on the general health is most remarkable and cheering. Even in very complicated and bad cases, in which sinuses communicate with the cavity of the joint, and the heads of the bones are ascertained to be in a state of ulceration, or partially necrosed, the good effects of perfect quietude of the joint will soon be manifested by cessation of pain, diminution of discharge, and speedy improvement of the general health. A cure of the local mischief may not be possible by this means alone, but much will often be gained, as regards the success of ulterior proceedings, by the rapid and certain amendment of the patient's condition." This salutary rest is the first part of the treatment of all diseased joints, and is continued, in general, throughout the whole period of cure ; it is obtained by the application of splints, varied in form and construction according to the particular joint affected.

Disease of the soft parts of the joint usually commences in an inflammatory form, requiring depletion ; when acute, the antiphlogistic treatment, local and general, must be very active, so as at once to arrest the morbid action ; and hot fomentation and poultice will generally be found more soothing than cold applications. When the more violent symptoms have subsided, the disease giving way, a determination to the surface, with discharge, lends powerful aid towards its final extinction. For this purpose vesication may be produced, by cantharides or by nitrate of silver ; or an eruption may be established by friction with a liniment of croton oil, or an ointment of tartrate of antimony, their strength proportioned to the nature of the part, and age of the patient. In chronic swelling of a joint, whether the effect of inflammatory action, or slowly and gradually supervening after injury, the diseased action must not only be arrested, but absorption also procured of the deposit and effusion within the synovial capsule and bursæ. To obtain the former indication, local depletion and counter-irritation are employed, according as the circumstances of the case require ; and to obtain the latter, uniform pressure of the whole swelling, and gentle irritation of the surface, are combined with the means of securing the all-important rest of the joint, according to the method first recommended by Mr Scott. The limb having been uniformly supported by a roller, from its extremity up to the diseased articulation, the surface of the swelling is covered by lint spread with some gently stimulating ointment,—soap cerate with camphor, for example, or that with a greater or less proportion of the unguentum hydrargyri ; and the whole articulation is then surrounded by long strips of adhesive plaster, drawn with moderate and uniform tightness, so as to support and gently compress the parts, without producing absolute pain or uneasiness. Above all, splints are applied to secure total immobility from motion ; and they may either be of leather or wood, as most suitable to the joint affected. When this dressing has become loose, from subsidence of the swelling, it is re-applied as often as may be necessary. Should fresh excitement occur in the joint, from any accidental cause, during this treatment, the apparatus must be discontinued, until such excitement has been subdued by the usual means already described ; and when the pressure is resumed, it should at first be very moderate. During the treatment the limb must be kept or gradually brought into the most advantageous position for ultimate use, particularly if, from the duration, nature, and extent of the disease, there is reason to expect impairment of the joint's motion. Thus, by steady extension with splints, the knee-joint may be brought into nearly a straight position, so that it shall be serviceable in progression ; and the elbow may be bent, to form a right angle

with the humerus, so as to be convenient for prehension. But such alterations of stiffened limbs must be proceeded with very cautiously, otherwise they may occasion undue excitement, and consequent renewal of disease in the joint. **Surgery.**

The preceding treatment will be found applicable to almost all joints, the hip not excepted. In morbus coxarius, for example, it is useful for securing immobility of the articulation, an object of such paramount importance towards arresting the progress of that formidable disease ; and in its advanced stages it is productive of at least relief. The joint is placed extended, that being the preferable position, in case of ankylosis, and surrounded by "soft lint soaked in a strong solution of gum acacia, which is laid on in strips over the side and pelvis, from the short ribs to the knee, and made to embrace the limb fully. A layer of dry lint is first applied, and then two or three others, soaked in the mucilage, follow : these are covered by a fold or two of coarse calico, and the whole is retained by a roller." Sometimes it is necessary to preserve the limb steadily in position by a wooden splint, as in fracture, until the composition has dried, and the splint, so formed, adapted itself closely to the parts. "This gum-splint can be made of any form, so as to allow of its being taken off, trimmed, lined with wash leather, or protected with a layer of oiled silk, and re-applied with a clean bandage. It can also be fashioned so as to leave any part exposed : the discharge from issues and abscesses can thus be allowed to escape, and the parts can be dressed, and otherwise attended to, without disturbing the limb. In fact, the apparatus can be varied as circumstances demand, and is applicable in a great variety of cases, and to any articulation." A similarly useful splint is made "of leather dressed without oil, cut to a proper form, moistened in hot water, and applied with a roller. It soon becomes firm, and forms a case which fits the part accurately ; it is then pared, fashioned neatly, and lined. In many chronic cases such splints answer admirably ; but the gum-splints can be applied with less disturbance of the limb, which in many instances is a great recommendation."

"In the painful and dangerous affections of the articulations, when the cartilages are extensively absorbed, and when the cancellated texture of the bone is more or less diseased, good effects may yet follow judicious treatment. Besides following out the principle of preventing all motion, great relief will often be experienced from establishing a permanent discharge from the neighbourhood of the diseased tissues. This can be done simply and effectually, without causing alarm, or exciting much pain, by confining a small piece of caustic potash on the skin near the diseased joint. The sore thus formed is deepened, and made to discharge freely, when disposed to heal, by a few hours' application of the antimonial ointment. A seton may be preferred in some situations : certainly discharge can be thus kept up, and derivation obtained from the affected parts, fully as well as by actual cauteries, moxas, pea-issues, or other farrier-like practices. Great care must be taken in the placing of issues ; they should be near to, but not upon a joint. Serious results have sometimes followed their careless application ; diseased action has been increased, they having reached, or even penetrated, the synovial capsule."

By the careful and judicious employment of such treatment, many affections of joints which resisted the less simple modes of cure formerly in use, are now successfully combated ; and many limbs are saved which our forefathers would not even have attempted to cure. But still there are too many cases which baffle all efforts to arrest the progress of morbid action ; and it becomes necessary, in order to relieve the labouring constitution, and preserve life, to remove either the diseased parts alone, or the remainder of the limb along with them by amputation. The former Resection operation is termed resection, and is the preferable, because of joints, the less mutilating and severe, when the case is such as to

**Surgery.** promise a tolerable certainty of success. Should it fail, amputation then becomes necessary; but by the failure, the chance of the patient's ultimate recovery is very much diminished. The cases for resection, therefore, should be carefully selected. The general health must not have been much impaired; the soft parts must not be extensively affected; the disease must be almost entirely limited to the articulating surfaces; the joint must be such that the bones can be reached easily, and without the risk of wounding parts of great importance; and the patient must be of that age and constitution most favourable to the reparation of injury. The articulating extremities of the bones are exposed by free incisions, planned according to the circumstances of the case, and the diseased portions are removed by suitable saws, or by cutting pliers. The soft parts are then replaced, and the cavity treated as a suppurating wound, the intention being that it should heal by healthy granulations from the bottom. In patients tolerably advanced in life, it is well to keep the maimed joint in perfect quiet, and in the position most favourable to the subsequent use of the member, in order that the cure may be by ligamentous ankylosis, otherwise the limb will prove weak and not much available, and disease will be liable to return. But in young persons of healthy constitution, motion of the part is encouraged during the cure, with every prospect of the new articulation becoming both free and strong. The elbow-joint is the one to which the operation is most applicable. In the shoulder-joint it sometimes is expedient, also in the carpus and tarsus; but in the knee and hip joints experience loudly forbids its performance.<sup>1</sup>

**Amputation.**

When however all milder means have failed, and resection is inapplicable, amputation must not be deferred until the disease has grown riotous in its progress, and the general health has been seriously impaired. When the surgeon is satisfied that amputation has become absolutely necessary,—that nothing else can save life,—the sooner it is performed, the greater is the chance that this severe remedy will not fail in its issue; and it is consolatory to reflect that modern improvement has greatly mitigated its horrors, and increased the probability of its success. It is performed more rapidly, more skilfully, and the suffering is infinitely less both during and after the operation. The tedious dissection of a limb, called the “circular method,” has now given place to the “flap-operation” by transfixion; the only valid objection that can be brought against which is, that perhaps a greater surface of wound is made; but this is much more than counterbalanced by the many benefits which it otherwise insures. The operation is more rapid, and less painful; the cut surface is smooth and regular; adhesion, or union by the first intention, is much more frequent; whether union be by the first or second intention, the cure is more speedily completed; the end of the bone is infinitely better covered, and the stump consequently more useful; and if the flaps have been skilfully formed, there will be no exfoliation of the end of the bone protruding through ulcerated integuments, and no formation of excruciating neuromata in the cut extremities of the nerves, rendering a renewal of operation necessary for final cure. The manipulations of the flap-operation are simple and well known, so need not be here detailed; but some rules necessary for its dexterous accomplishment are not always sufficiently attended to. The first regards transfixion; and it is, that after the first flap has been formed, the knife should not be again entered close to the top of the wound, but about an inch below, as thus cross-cutting of the integument is avoided. Another is, that in sawing the bone, the surgeon must not trust the distal portion of the limb entirely to an assistant, but, grasping it in his left

**Surgery.** hand, must himself regulate its support, and so avoid splintering the bone. Pressure to command the bleeding need not be severe, but must be true. As was formerly stated, the tourniquet is seldom if ever used when the fingers of an assistant can be obtained who is cool, steady, and well conversant with the course of the vessels. The pressure thus obtained is not applied until the instant the incisions are commenced, and then only on one point; the limb consequently is not gorged with blood, as it would have been by the ordinary tourniquet: less blood therefore is lost, and besides, the flaps are much more easily retracted from the bone. When skilful assistants cannot be obtained, or when it is probable that many vessels will require ligature, and that consequently pressure must be long continued, a strong metallic spring may be used, each extremity terminating in a pad, one placed over the course of the vessel, the other resting on the opposite part of the limb: the assistant preserves its just application, and regulates its pressure, and the risk is avoided of his fingers giving way from cramp or fatigue. When the surgeon, from want of other means, is compelled to use the ordinary screw-tourniquet, its principal pressure should never be applied until the moment before incision; and as soon as the larger vessels have been secured, the whole apparatus should be removed, as thus the loss of much blood by regurgitation, and particularly from veins, will be avoided. The arterial orifices are secured by ligature, according to the method already mentioned; and should the venous trunks continue to pour out their contents, notwithstanding the removal of all constriction of the limb, pressure by the fingers of an assistant, though for only a short time, usually suffices to arrest the hæmorrhage. The wound is treated according to the principle of delay formerly explained; and thus adhesion is not only favoured, to the saving of time and pain, but the occurrence of secondary bleeding is also made much more improbable; for no warm coagulum is bound up in the wound, to act as a sponge, and encourage escape of blood from all the untied vessels; and even when it does take place, the bleeding point is much more easily secured than when the stump is bound up tight and close from the first. Should the stump bleed seriously, six, eight, ten, twelve, or fifteen days after the operation, in consequence of sloughing or some other unhealthy action having supervened, the ununited wound is to be laid open, all coagula removed, and direct pressure applied. But should this fail, the surgeon ought instantly to secure the trunk of the vessel whose branches are at fault, at some distance above the stump—in amputation below the knee, tying the femoral, for example—at the same time supporting the stump by bandage. This practice has been found almost invariably successful.

Amputation is also less frequently resorted to in cases of severe injury than formerly. In fractures, skilful and careful management preserves many a limb useful and but little out of shape, which before would have been considered too seriously injured to retain its vitality. Nor are compound luxations regarded with the same dread. In compound Dislocation of the ankle-joint, for example, with protrusion of the bones, instead of at once amputating the limb, the dislocation is reduced, the protruding portions of bone having been removed in whole or in part, if so injured as to render that proceeding necessary; the limb is retained in a favourable position, and in a state of complete rest; the wound is treated by the simple soothing plan; undue excitement is warded off or held in subjection by the usual means; if abscesses form, they are early evacuated; the parts are uniformly and gently supported; the surgeon's medical acquirements are kept constantly on the alert; and thus, in very many cases, the limb is retained, with the injured joint,

<sup>1</sup> For further information on resection of joints, see Mr Syme's excellent treatise on this subject.

**Surgery.** though stiff, exceedingly useful. The ordinary simple dislocations are now at once detected by the observant and well-educated surgeon, and as readily reduced if recent; so that branch of the profession promises to be soon rescued completely from the maltreatment of ignorant empirics.

**Fractures.** The whole treatment of fractures has been simplified and improved; the process of reparation in disunited bone is better understood, and the means which favour it are more skilfully and effectually adapted. In fractures, whether compound or simple, of the smaller bones, more particularly of the upper extremity, the gum-splint will be found very suitable. By the employment of these or other light splints,—of wood, pasteboard, leather,—well padded, so as not to fret the integument, and always of sufficient length to command the neighbouring joints, the bones are not only kept accurately in their proper place, but perfect quietude and freedom from all motion are likewise secured,—a point all-important here, as in the treatment of dislocated joints. Broken limbs are no longer laid out in state on pillows, altogether unrestrained. Absolute rest, following early reduction of the bones, and combined with strict attention to the workings of the general system, usually succeeds in preventing interruption of the cure by undue excitement in the neighbourhood of the injury. Should this nevertheless occur, the retentive apparatus can be so arranged as to admit of the part in fault being attended to as freely and as often as is necessary, without disturbance of the rest of the limb; for example, blood may be abstracted locally, fomentation or poultice applied to a particular part, abscesses opened, and wounds dressed, without undoing all the retentive apparatus, and so jarring the fracture. In severe compound fractures this advantage is particularly important. The soft parts can be looked after as well as if no apparatus at all were applied; and the untoward results likely to follow such a serious accident can consequently be sometimes averted, and always moderated, while the hard parts are uniformly kept in the condition most favourable to their union. In fractures of the lower extremity near the hip-joint, Desault's splint is still in use, somewhat modified. When the break is lower in the limb, an improvement of Macintyre's double inclined plane is by much the most suitable apparatus, combining in an eminent degree the advantages of complete rest of the whole limb, with ready and convenient dressing of particular parts.<sup>1</sup> The patient is also able, with safety, to be out of bed, and in the erect posture, at an early period of the cure; a circumstance very favourable to the preservation of the general health.

**Gangrene.** When, notwithstanding care and skill, gangrene occurs after severe fracture, either immediately, or in consequence of greater vascular excitement having taken place than the hurt parts are able to bear, amputation must be had recourse to, and the period of its performance is now no longer a subject of dispute. It must be done immediately, in sound parts, at a distance from the gangrene, without waiting for a line of separation, as in chronic gangrene, else the surgeon will expect the opportunity in vain, and meanwhile his patient will sink.

**Disunited fracture.** Sometimes, either by the carelessness of the surgeon and inefficiency of his treatment, or from the fault of his patient or defect of his constitution, union of the fracture fails to take place. In recent cases of such disunion, adjustment of the broken ends in accurate apposition, and undisturbed rest of the fracture and of the whole limb, will occasionally effect a tardy union. But usually it becomes necessary to rouse the parts; and the method now followed, the most convenient, as well as most successful, is the introduction of a seton between the fractured extremities, gradually increasing the size of the tape, but taking care to remove it altogether as

**Surgery.** soon as it appears that excitement has been produced, sufficient for establishing the regenerative process. A few days are usually enough; when ignorantly permitted to remain for a long period, the mere presence of the foreign body, and more particularly the constant discharge which it maintains, tend most powerfully to prevent the result in favour of which it was employed. After removal of the seton, the limb is placed in the proper position, and must be preserved in a state of most complete rest.

In fractures and other injuries of the cranium, the trephine is now used with better judgment than formerly; of the cranium. It is more sparingly in most cases, more readily in others. It is not considered necessary to convert every fissure of the skull into a chasm, by following it out with the trephine; in depressed fracture with compression of the brain, the application of the trephine is imperative, but no more bone is taken away than is necessary for the raising of the depressed portion, and the removal of what is so injured by the accident as to render its retention of vitality improbable; and to bore one or more holes in the cranium in search of extravasated blood, is generally regarded as a proceeding equally mischievous and unprofitable. But in punctured fracture, the necessity for the trephine is urgent; it must be used freely and at once; and as this important point of practice is perhaps not yet sufficiently attended to, we shall be a little more explicit on the subject. The punctured or star-like fracture is occasioned by a sharp body striking the head with considerable force. The integuments are divided, and the surface of the bone presents an appearance of injury somewhat resembling what is often seen in ice when struck in a similar way. But this is a very slight extent of damage compared with what the inner table suffers, when the puncturing weapon has passed through the diploe, as is usually the case. The inner table, being by much the more vitreous, is shivered into numerous spiculae, which being driven inwards by the force of the blow, perforate, or at all events grievously irritate, the coverings of the brain, producing inflammatory action, soon affecting that important viscus, and, if not arrested, proving speedily fatal. After the infliction of such an accident, therefore, even should the patient be at the time so little affected as to walk to the surgeon to have his wound dressed, the trephine should be immediately applied to the punctured point, in order that a portion of the bone may be removed, sufficient to allow extraction of all the displaced portions of the internal plate. In no other way can we avert intense inflammatory action from the wounded dura mater, extending in all probability to the brain and its more immediate investments. Even should the practitioner be in some degree successful in moderating the more immediate mischief by antiphlogistics alone, the necessity for trephining will still remain, on account of abscess under the bone, occasioned and kept up by the spiculae; the matter must be evacuated, and the cause of its formation must be removed. It is surely infinitely better, therefore, to operate in the first instance, and so avert all such calamities. Abscess sometimes forms between the dura mater and the bone, as a consequence of mere contusion; its occurrence, and usually its site, are indicated by constitutional disturbance, peculiar oedema of the scalp, unhealthy discharge from the wound, and a pale necrosed appearance of the bone. In such cases, also, perforation of the skull should not be delayed; for it will usually succeed in evacuating the matter, and relieving the patient. But, on the whole, "trepanning of the skull, which, with our forefathers, appears to have been an everyday occupation, is an operation now very rarely resorted to." After its performance, from whatever cause, there is now no rasping of the bone, or cutting away of the integuments; the edges of the circular aperture are denuded of their pe-

<sup>1</sup> For more minute details regarding these splints, see Liston's Practical Surgery, p. 80, *et seq.*

**Surgery.** riosteum as little as possible, and the soft parts, having been carefully replaced, are treated as a suppurating wound; the deficiency of the bone is filled up by a ligamentous expansion, incorporated with the granulating integument. When a large portion of the skull has been removed, it is well to afford support to the cranial contents, by the application of a compress and bandage.

**Erysipelas.** There is no more successful caterer to the amputating knife than erysipelas inertly treated; destruction of bones and joints has been too often its result. The improved treatment by incision, however, now in general use, saves many a limb entire and unscathed. So soon as tension of the surface indicates that the cellular substance is so infiltrated as to threaten destruction of the tissues, free incision must be immediately had recourse to; the knife is used not only to evacuate matter, but to anticipate its formation, and prevent its baneful consequences. In the milder cases,—and in erysipelas of the face, where incisions cannot be practised with propriety,—sufficient relief is obtained by making, with the point of a lancet, numerous punctures in rapid succession; effusion from which is encouraged by hot fomentations. In most cases, even when severe, division of the integument and subjacent cellular tissue suffices; but if the infiltration has extended to the inter-muscular tissue, the knife must follow: its free use may appear harsh, but is in reality a valuable kindness. The burrowing of matter is prevented, and consequently also sloughing of the soft parts, the opening up of bursæ and articulations, and the denuding of bones by destruction of their periosteum, ending in necrosis more or less complete. Museums were at one time copiously enriched with splendid specimens of necrosis of the long bones, throughout almost the whole extent of the limb, all the result of neglected erysipelas; but the bistoury has superseded the amputating knife, and such preparations fortunately are now become valuable by their rarity.

**Abscess.** Similar remarks will apply to the early opening of abscesses in general. "Pointing" is not now waited for; before that takes place, irretrievable mischief may have been done. The *tactus eruditus* having acquainted the surgeon with the existence of purulent formation, it must be reached by his bistoury, at whatever depth, if it be in the neighbourhood of joints, bones, or vessels, and more particularly if close to important cavities or canals. The mere contact of purulent matter will not injure these, but its pressure will, and from it they must be relieved, lest their functions be interfered with or their structure destroyed. For example, purulent collections in the fauces are evacuated by the bistoury before the patient is threatened with suffocation; and abscesses in the perineum, and neighbourhood of the anus, are drained by an external opening before they have become troublesome fistulæ.<sup>1</sup> The knife must of course be used cautiously when the abscess is deep, lest the vessels and other important parts be wounded; but let not the fear of this deter the surgeon from relieving abscesses in their immediate neighbourhood, for "the vessels and nerves are displaced by the morbid accumulation, and the knife is passed safely, in their course, to such a depth as would greatly endanger them in the healthy state of the parts." The opening should in all cases be made sufficiently large to afford a free exit to the matter; it should be placed in the most dependent part of the cavity, with which view the prevailing position of the patient should be considered; and sometimes more than one opening should be made at once, to

prevent the necessity for future counter-openings, or the formation of sinus,—as when the abscess extends over a considerable surface, and cannot be made to discharge through one aperture. After evacuation, in assisting which no pressure or squeezing should be employed, fomentations and the water-dressing are applied. When the rule of early opening has not been attended to, and the abscess in consequence has become chronic and of large size, free incision should still be made at the most dependent point of the tumour, notwithstanding the advice of the late Mr Abernethy to the contrary; for experience has shown that the Abernethian treatment of chronic abscess is more likely to produce constitutional disturbance, with unhealthy excitement of the cavity, than when the matter is allowed a free and constant drain, and the parts are at the same time duly supported. In establishing an artificial abscess, or issue, the modern caoutchouc seton is a great improvement on the skein of silk or cotton formerly used, requiring no renewal on account of decay, and absorbing no discharge.

Ulcers, like wounds, are now treated more simply and better; and better because more simply. The healthy suppurating sore is covered, like a suppurating wound, with the plain and light water-dressing; simple in the first instance, afterwards medicated by gentle stimulants or not, according as the progress of the sore may seem to require. When stimulants are used, their solution is at first weak, and is increased in strength very gradually, lest the discharge should be suddenly suppressed and the sore consequently inflame; the object is simply to moderate discharge, and check weak exuberance of granulation. An inflamed ulcer is subdued by the hot-water dressing, combined with antiphlogistic regimen, rest, and elevation of the part. An irritable ulcer is soothed by the water-dressing, and occasional slight application of the nitrate of silver to the jagged angry edges of the sore; or the lint may be dipped in a bland anodyne solution. In all such dressings, the lint is kept constantly invested by a portion of oiled silk, larger than itself, to prevent evaporation of the fluid in which the lint has been soaked. When granulations prove exuberant, they are to be reduced to the proper level by the application of sulphate of copper, or may be shaved off by the rapid sweep of a thin sharp bistoury; or the surface may be compressed by dry lint and bandage. An indolent ulcer is stimulated to healthy action by pressure and support, combined if necessary with a direct stimulant application. This last description of sore is the most common, and is usually found afflicting the labouring classes, to whom the restoration of a limb is of more importance than to any other class of patients; a speedy cure is therefore of no little consequence. It is best effected by the method first recommended by Mr Baynton. When the patient applies for relief, there is usually considerable excitement around the sore, and this must in the first instance be corrected by the usual means. Then the foot and lower part of the leg, for it is the part commonly affected, having been uniformly supported by bandage, the sore is compressed by adhesive plaster, applied in strips encircling the whole girth of the limb, and with their extremities crossed over the sore; if this is large, and pouring out much discharge, it is well to cut a small hole in the plaster where it covers the ulcer. The application having been made to extend about an inch on each side of the sore, a little fine tow is placed above it, to absorb discharge, and the whole is retained

<sup>1</sup> Dr Radcliffe has probably few imitators at present in his clumsy method of emptying abscess of the fauces. "He was once sent for into the country to visit a gentleman ill of the quinsy. Finding (supposing) that no external or internal application would be of service, he desired the lady of the house to order a hasty pudding to be made; when it was done, his own servants were to bring it up. While it was preparing, he gave them instructions how they were to act. When the pudding was set upon the table, the doctor said, 'Come, Jack and Dick, eat as quickly as possible; you have had no breakfast this morning.' Both began with their spoons; but, on Jack's dipping once for Dick's twice, a quarrel arose. Spoonsful of hot pudding were discharged on both sides; handfuls were pelted at each other. The patient was seized with a hearty fit of laughter, the quinsy burst, and the patient recovered." A moment's use of a straight sharp-pointed bistoury would have saved both time and the pudding.

**Surgery.** by continuation of the bandage which supports the lower part of the limb. This dressing is removed at the end of forty-eight hours, or sooner if necessary. The sore itself is not to be washed or rubbed, for its own secretion is its natural and best protection; but the surrounding skin is wiped clean, and, if excoriated by the pressure, bathed with a spirituous lotion; the dressing is then re-applied as before. By such manipulation, repeated as often as is necessary, the indolent surface of the sore is stimulated to the formation of healthy granulations for raising its depressed surface, while at the same time the swelling of the surrounding skin and cellular tissue is diminished by absorption; and thus, the sore and its margins having been brought to one level, cicatrization proceeds. After the ulcer has in this way been converted into the simple suppurating sore, either the same dressing may be continued, exerting less pressure, or it may be superseded by the medicated lint and oiled silk. When nearly closed, all dressing may be discontinued; the natural secretion forming a crust, under which cicatrization is speedily completed. Of course healing will be materially assisted by rest and elevation of the limb; but the labouring man cannot always afford this, and the treatment by plaster, just described, possesses, in addition to its other virtues, this advantage, that with it the patient can continue in the erect posture with much greater impunity than when using any other application. For some considerable time after cicatrization, the limb should continue to be supported by a bandage or laced stocking. Another frequent ulcer is the weak sore, with thin, dark-red margins, based on cellular tissue almost sloughing, and emitting a thin unhealthy discharge. Such generally form in clusters, and can be brought to heal only after the unsound parts have been destroyed by the potassa fusa, so as to obtain a sound foundation on which the reparative granulation may arise. This description of sore, however, is too often combined with and dependent on a strumous diathesis, and is healed only to break out afresh.

Such is a bare outline of the modern treatment of ulcers, to which however no fixed and absolute rules can be made to apply; for sores are often changing their character and appearance, though perhaps but slightly, and consequently demand as frequent a change in the treatment. "A judicious practitioner, by varying his applications according to the appearance and disposition of the sore, will serve and benefit his patient much more efficiently than by trying empirically this or the other new specific, or blindly applying one remedy for every sore, because he has seen its good effects, or been informed of its answering miraculously in one or two instances." Be it likewise remembered, that in no class of diseases is attention to the general health more requisite.

**Hospitals.** We may here allude to the general improvement in hospital practice, in consequence of which the hospital sore, so long and so frequently a scourge in those valuable institutions, is now almost unknown. The ventilation, cleaning, and general arrangement of the wards, the diet, clothing, and classification of the patients, are all improved; but probably nothing has tended so much to the disappearance of this formidable disease, as the substitution of tow for sponge in the dressing of sores; a change apparently simple and insignificant, but in reality most important. Formerly both nurses and dressers were in the habit of using one sponge for the sores and wounds of a whole ward, and if in one patient unhealthy action supervened, the vitiated discharge was soon afforded an opportunity of inoculating all. Now, sponges are not seen but in the operating theatre; washing of wounds and sores has been discontinued, because found to be preju-

dicial to cicatrization; and when the parts around require cleansing, this is effected by means of tow, which, when used, is immediately thereafter destroyed or thrown away. **Surgery.**

In aneurism, the discovery of Hunter has been most successfully extended. Further investigation in arterial pathology, especially as to the effects of ligature, has produced the most important results. The accumulated knowledge and experience, applied to practice by the talents and courage of Scarpa, Abernethy, Astley Cooper, Liston, Stevens, and Mott, have achieved most triumphant advancement in surgery; for thus the means of cure have been happily extended to cases of aneurism, formerly regarded as irremediable. There are many aneurisms, and not of unfrequent occurrence, on which the surgeons of the last century were content to look until the tumour burst, and their patient perished under their very gaze, which are now fearlessly encountered, and with the best hopes of success. In aneurism of the neck, Hunter and Scarpa led the surgeon to believe that a ligature placed on the carotid, between the tumour and the heart, might effect a cure, and Cooper proved that it did so. This arresting of the cephalic circulation is no longer looked upon with insurmountable dread; for experience has shown, that even both carotids may be tied, with but a short interval between the operations, and without any untoward result. The surgeon's knife and ligature have, in the cure of aneurism, ventured even so near the heart as the arteria innominata, but hitherto unfortunately without ultimate success; indeed it is doubtful whether the operation on this vessel can ever prove successful, there being so many inevitable obstacles to complete consolidation by ligature; as yet, ulceration has always supervened, occasioning fatal hæmorrhage. The subclavian has been delicately on account of axillary aneurism. Mr Liston had the honour to be the first who did so with success; and an equally happy result has not been unfrequent since. Ligature of the axillary and humeral arteries, though difficult, is regarded as scarcely unusual. The aneurisms of the groin and hip were left to run their course unmolested, until Abernethy and Stevens showed that the Hunterian operation could be extended even to them. "The common, external, and internal iliacs, are now tied without much difficulty, and very often with a successful issue. These operations are quite justifiable, provided always there has been no mistake in diagnosis, and that there is nothing in the state of the patient's health, or in the condition of the arterial system, to contra-indicate interference." The original operation on the femoral, on account of aneurism in the ham or in the lower third of the thigh, is now looked upon, when skilfully executed, as at once the simplest, most beautiful, and most successful interference with the larger arteries. Thus we see that all aneurisms of the extremities are within the reach of art, and that a certain degree of success has attended the approaches towards the trunk, as far as the common iliac and arteria anonyma.<sup>1</sup> It is to be feared that "the force of surgery can no further go." It is indeed a triumph that it has gone so far; and we cannot reasonably expect that ligatures, placed nearer the great centre of circulation than either of the above-mentioned vessels, can ever be productive of a successful result. Surgical invention and enterprise have not, however, been easily baffled; and in those cases of aneurism too deep to admit of the Hunterian method of operation, it has been proposed to reverse the procedure, and place a ligature on the distal side of the tumour. The operation has been put in practice, and in a few cases with some temporary advantage, but the general result is not encouraging. Great difficulty has sometimes been experienced in discovering the vessel destined for the ligature, in consequence

<sup>1</sup> The aorta has been tied, but with a result which does not warrant repetition of the experiment.

**Surgery.** of displacement by the tumour, or more or less obliteration of its calibre. It is an operation "which, in a favourable case, and at the earnest solicitation of a patient, a surgeon might be induced to adopt, as the only though desperate remedy for an otherwise incurable disease; but it is not a proceeding which he would be warranted in urging his patient to undergo." In false aneurism from wound, as at the bend of the arm, if pressure methodically and firmly applied—the whole limb below the wounded point being duly supported—fail to arrest the formation of tumour, recourse is had to the ligature. If the tumour be recent, soft, and superficial, and the parts around not much infiltrated, the wounded point may be exposed at once by incision, and ligature placed above and below the aperture. But if the tumour be of considerable duration and size, ligature of the trunk, between the tumour and heart, is the preferable and equally successful proceeding.

The more important steps in effecting deligation of the larger arteries, whether for true or false aneurism, may here be briefly mentioned. The incisions are made with a small, finely-edged scalpel, used lightly and cautiously; neither directors nor blunt knives should be employed, for they must bruise or tear to a certain extent; and the simpler and smoother the cut is, the greater is the probability that both wound and artery will assume a healthy action. The vessel having been exposed, its sheath is opened on the anterior aspect, to the extent of about an inch, and the point of a blunt aneurism-needle is gently passed beneath and around the artery, great care being taken to exclude nerve and vein from its circuit. A strong silk ligature having been thus passed, its loop is cut, and one half withdrawn along with the needle; the other is firmly secured on the artery, its effect on the tumour having, by previous pressure, been ascertained to be satisfactory. In placing the knot on deep-seated vessels, Mr Weiss's instrument will be found to afford important assistance. "All this must be done without disturbing the position of the vessel, without detaching it from the sheath, or breaking up its fine cellular connections laterally and behind, further than is barely sufficient for the passage of the needle. There must be no lifting of the vessel on the handle of the knife, or on the director, as if in triumph; for ulceration of the arterial coats, and secondary hæmorrhage on or about the separation of the ligature, are the almost inevitable consequences of such proceedings." If by accident the vessel has been disturbed from its connections, two ligatures are to be applied, one at each termination of the separated portion; but in general one single ligature is much preferable. Both its ends should never be cut away close to the knot; for, in addition to the ordinary disadvantages found to belong to this plan, there is no slight risk of abscess, caused by the deserted knot, inducing secondary bleeding by ulcerative absorption of the arterial coats. And indeed the surgeon will feel more comfortable, in such anxious cases, if he leave both ends pendent from the wound. For a like reason, separation of the ligature should be throughout its whole course spontaneous; rash pulling at its ends may be productive of the most serious results. The wound is brought together, and otherwise treated, according to the principles formerly detailed. Should secondary bleeding unfortunately occur, the vessel must be exposed above and below the source of hæmorrhage, and a ligature applied at each point. But if the original operation have been judiciously as well as dexterously performed, and the after-treatment carefully conducted, such an untoward result need scarcely be dreaded. Should pulsation return in the tumour, on the complete establishment of collateral circulation, pressure well applied will suffice to perfect the obliteration of the sac.

**Veins.** In dilatation or varix of the veins, if methodical pressure and attention to the bowels fail to remove the disease, or

at least its inconveniences, a radical cure is obtained by **Surgery.** obstruction of the calibre of the main trunk, on the cardiac side of the dilatation; and this is effected either by the application of potass, or by including about an inch of the vein, at that part, between two points of twisted suture; the needles being passed beneath the vessel, and removed as soon as sufficient excited action has been produced in the venous coats. Either method is effectual in obtaining obliteration of the vein's calibre at the selected point: the latter is, perhaps, in most instances the preferable; but in both the procedure must be cautious, and the after-treatment watchful, in order to guard against hæmorrhage and extension of inflammatory action.

The operation of phlebotomy has always been simple **Venesection.** and of easy execution; in regard to it, the only modern improvement which we have to notice, is the comparative rarity of its performance. It was, and still is, too much the custom to bleed, so as to appear to be doing something active in treatment, not only when the proceeding has seemed to the ignorant practitioner likely to do no harm, but also when a wiser head could have told that it must do irremediable mischief. The good fortune of the first phlebotomist, Podalirius, seems to have produced in his successors an unfortunate attachment to the operation, which has been communicated from generation to generation, and from which our day is not yet wholly exempt. In very many cases it is doubtless the only certain means of relief, and must be employed readily and boldly; but in fully as many it had better be done with a sparing hand, or altogether omitted. What can be worse, for example, than to find a patient who has just sustained a severe accident—still labouring under the shock which the injury has produced, pulseless, and with the powers of the system all but extinguished—robbed by an ignorant or reckless man, unfortunately called to his aid, of that very fluid, and consequently of those very powers, of which he is at the time most in need, and without which the syncope must soon pass into death. Such a case is too frequent even now: but it is consolatory to know that the folly of such proceedings is becoming more and more extensively known, and that the thoughtless, mischievous practice of indiscriminate venesection is more and more abandoned.

A similarly absurd practice prevails in regard to the **Bruise.** treatment of bruise. Leeches are instantly applied, in order that they may suck out the extravasated, or "bruised blood," as it is called. These little animals drink only from the running stream, drawing for themselves from the blood-vessels, and therefore fail to perform what is expected of them by their employers. At the same time, their bites, admitting the external air to the extravasated blood, may induce suppuration of an unhealthy kind in the cellular tissue. They are of use simply as a mode of local depletion, in order to moderate or avert inordinate excited action occurring as a secondary result of the accident.

In the treatment of hernia, the advancement of anatomical knowledge has rendered operative procedure more simple, safe, and effective. And pathological experience having now fully established the great danger of delay after the taxis, fairly tried, has been found unavailing, the operation is had recourse to at once, with a much more certain prospect of success. In the greater number of cases the taxis will prove successful, when employed early and with skilful perseverance. But as soon as the surgeon is satisfied that his unarmed hands, assisted by his medical skill, are incapable of reducing the tumour, each moment of delay is culpable until he assumes the knife, and by it relieves the constricted parts; for by its keen edge the patient is infinitely less endangered than by even brief continuance of the incarceration. This principle, now generally acted on, saves many a patient who formerly would either have perished in excruciating torture, or lingered on

**Surgery.** with artificial anus, noisome to others, and a burden even to himself. But this is a subject too extensive to be here more fully considered. Endeavours towards the cure of artificial anus are made by the apparatus, and according to the system of treatment, invented by Dupuytren; and sometimes they prove successful.

**Calculus disorders.**

In the treatment of calculous disorders, modern improvement has effected much. Chemistry, happily combined with pathology, has taught the surgeon in many cases to anticipate cure by prevention, detecting the tendency to deposit in the secretions of the kidney, ascertaining the exact nature of that deposit, and then applying, according to its nature, the suitable corrective. When there is reason to believe that calculus has actually formed in the bladder, its presence is to be ascertained by careful sounding. Many affections—for example, diseased kidneys or fundament, worms or other causes of irritation in the bowels—occasion all the ordinary symptoms of stone; and it is only after the surgeon has distinctly heard the stroke of his sound on the foreign body, that he can be certain that a stone exists. The most convenient instrument for exploring all parts of the bladder is a sound, steel throughout, with a sharp and sudden curve. When, by its cautious and patient use, the presence of a calculus is no longer doubtful, and some estimate has also been made of its size and form, the question then arises between patient and surgeon as to the preferable mode of its summary extrusion; for removal by chemical solvents, though sanctioned by act of parliament, is no longer trusted to. It is only within these twenty years that a power of selection has existed; till then, the knife alone presented hopes of relief. Now, however, *cutting* is often superseded by *crushing*, and rightly. Indeed it is a *questio vexata* among many, as to whether lithotomy or lithotripsy be the better adapted for general use; and each has its zealous and uncompromising advocates. As is usual in such cases, we shall probably find that truth lies in the middle, and that both operations must still be employed, each finding cases to which it is peculiarly applicable. Lithotomy was at first a very imperfect art, difficult and complicated in performance, often failing in the attainment of its object, and not seldom followed by the most untoward results. Its practice was likewise in a great measure confined to a particular set of operators, not the best qualified for such undertakings, who, regarding it as a means of gain alone, were not long in bringing discredit on its reckless and indiscriminate use. Thus a great advantage was given to the old operation, over its imprudently managed rival. But the instruments and procedure of lithotripsy have of late been greatly improved, and have become, as is usual in such improvements, more easy and simple, and at the same time more effective. They now receive the attention of every well-educated surgeon; the student applies to lithotomy and lithotripsy with equal care and attention, and endeavours to perfect himself in the manipulations of both; and in consequence, the latter operation has been rescued from the empirical professor, and placed in the better qualified hands of the regular practitioner. There is not now, as in the time of “the invasion of professed stone-grinders,” some years ago, an indiscriminate performance of one operation, in all cases, simply because the operator knows no other. The circumstances of the case had then very little influence in determining the nature of the operative procedure. If a surgeon was applied to, the knife was recommended; and “if the patient fell into the hands of the professed stone-grinder, he was certain, under all circumstances, of being subjected to the hammering and boring processes.” Now, application being made to the regular practitioner, at least in the first instance, he, equally acquainted with either mode of operating, conscientiously advises the one which circumstances require, either operating himself, or employing one whom he may consider more dexterous and equally skilful. Lithotripsy can only

**Surgery.** be safely performed by those “who understand well the healthy anatomy of the urethra and bladder; who are acquainted with their sympathies, vital actions, and pathological changes; and who understand and practise the treatment of their deranged functions.” And by such it is now performed, in the cases to which it is applicable. In patients above the age of puberty, when the symptoms have not been of very long duration, when the stone has been ascertained not to exceed a chestnut in size, when the urethra is free from contraction, when the bladder is capacious, tolerably healthy in its coats, and free from irritability of its lining membrane, and when the individual is of an easy, patient disposition; under a combination of such circumstances, lithotripsy is the preferable operation; in other cases, lithotomy. It is thus apparent, that possibly lithotripsy may in time almost entirely supersede lithotomy in the adult; all that is necessary being, that the patient apply to a well-qualified surgeon at the very commencement of his ailments. But until wisdom shall pervade mankind to this extent, very many cases must occur in which the old operation, well performed, is much to be preferred; and this need not be greatly regretted, for the actual difference between the two operations as to pain and danger is not so great as is generally supposed.

The simple instrument of two branches, as made by the Messrs Weiss, has superseded all the more complicated and less effective apparatus for lithotripsy; as also Cooper's forceps for removal of small stones by the urethra. The instrument having been introduced into the bladder, tolerably distended, is brought in contact with the stone; its blades are opened, and the stone brought between, great care being taken that the mucous membrane is uninjured; the blades are then approximated by the screw, and the interposed stone crushed more or less completely. When the stone is single, small, and friable, one such proceeding will suffice: if not, the fragments are seized and bruised in succession, either at the time, or at one or more subsequent sittings. The screw-power is preferred to that of the hammer, as equally efficient and more safe, not endangering the twisting or breaking of the instrument. Diluents are freely exhibited, to promote and facilitate passage of the detritus with the urine. Should the pain and irritation thus occasioned prove severe, opiates, blood-letting, and hot bathing, may be required. But, in general, if the case have been judiciously selected, and the operation skilfully performed, the subsequent irritation will be but slight; and after a few days, examination of the bladder may be resumed, to ascertain whether or not all the fragments have been extruded. This exploration cannot be too minute and careful, for the greatest stumbling-block to the advancement of lithotripsy in the confidence of the profession, has been the uncertainty as to whether or not the bladder has by such proceedings been completely freed from every fragment, it being well known that but a very small portion of foreign matter remaining will become the nucleus of further deposit, and speedily re-establish the disease. The advantage of lithotomy is, that, for final exploration of the bladder, it has the finger, which, if at all experienced, can seldom be deceived. Lithotripsy has but the sound for the same purpose, and must endeavour to make patience, dexterity, and care, compensate for the inferiority of the instrument.

But when the stone is large, and has been long resident in the bladder, this viscus has its cavity contracted, its coats fasciculated, and its surface irregular, affording receptacles for the fragments, from which the most careful manipulations may not dislodge them. Besides, such a bladder will not bear the annoyance of instruments often introduced; indeed the mere change of a tolerably smooth stone into angular fragments, may be sufficient to excite even fatal disturbance of the viscus and of the system. In all such cases, therefore, lithotomy is the preferable operation; it

**Surgery.** not only insures, with common care, complete removal of the source of irritation, but also, by suspending the functions of the diseased viscus, gives it the advantage of rest, as well as the relief caused by loss of blood from the neighbouring vessels. Even when the bladder is tolerably sound, a large stone of ordinary consistence is unfavourable to lithotrixy; for the fragments must also be large, until after much manipulation; and attempts to pass such fragments must be attended with much pain and some danger. The immediate result of lithotrixy in such cases is, "like the partial delivery of a pregnant woman," very unsatisfactory. The fragments may become firmly impacted in the urethra, causing retention of urine, and all its direful consequences. When this happens, and the impacted portion will not yield to an attempt to push it again into the bladder, it must at once be reached and removed by incision in the mesial line; and then the surgeon may take the opportunity of extending the wound a little farther, and with his finger and a scoop effectually clear the bladder of all remaining detritus. Lithotrixy is scarcely applicable to young subjects; the parts are not sufficiently capacious, the patient is too restless, and the concretion, usually of oxalate of lime, is too hard to be easily pulverized. This is the less to be regretted, as in them well-performed lithotomy seldom if ever proves unfortunate. Among them, therefore, and "those of mature age who are so foolish or so ill informed as to permit the stone to attain an inordinate bulk," lithotomy must still prevail. It is an operation certainly more alarming to the patient, and to the surgeon may be more difficult and perplexing; but when dexterously and skilfully executed, we doubt much if its average risk exceeds, or even equals, that of promiscuous lithotrixy; its efficiency is indisputably greater. The mode of operation pursued by Mr Liston, the most dexterous, elegant, and successful lithotomist of the present day, is similar to the method of Cheselden. For its details we beg to refer to Mr Liston's late work on Practical Surgery, where the modern lithotriteur is also minutely described. He attributes much of his success to limited incision of the prostate, so as to preserve the internal cellular tissue of the pelvis from infiltration of urine; and to the insertion of a gum elastic tube in the wound, so as to afford a free exit to the urine, and diminish the risk of its poisonous infiltration, while at the same time it facilitates the arresting of hæmorrhage, should this occur. "The operation of lithotomy," says he, "if performed in the easy and simple method recommended, is effected with much less pain than is supposed; it is completed, with perfect safety, in a short space of time, and offers very favourable results. It is, however, an operation which ought never to be undertaken without due consideration of all the circumstances that may arise; and the surgeon who does undertake it must have resources within himself to meet with and overcome difficulties in all the various stages of the proceeding."

**Stricture.** In the treatment of stricture of the urethra, all armed bougies have been laid aside, in favour of the plain metallic catheter and bougie. The milder cases are easily overcome. A plated steel bougie, selected of such a size as will with no great difficulty pass the constricted part, is gently insinuated along the urethra. After three or four days, the introduction is repeated. Then at each farther re-introduction, at an interval of a few days, the size of the instrument is gradually increased, until it completely fills the orifice; a sign that sufficient distention of the canal has been achieved. After this, it is right to pass the last instrument occasionally, at long intervals, to counteract any tendency towards return of the contraction. Soft pliable bougies may sometimes be useful for mere exploration of the canal, but are not of much use otherwise; it being difficult to guide their points, or ascertain the exact direction which they assume. During the cure, the state of the urine should be strictly attended to; for its acidity—one

of the causes of stricture—may, by irritation of the urethra, materially retard the progress. Should the bougie cause serious irritation of the urethra, as sometimes happens, the interval between its introductions must be increased, allowing the painful effects of each to subside before another is attempted, else much more harm than good will accrue from the use of the instrument. For the penetration of tight unyielding strictures, a firm silver catheter is the most appropriate instrument, its size being proportioned to the extent of contraction. For very obvious reasons, great caution must be observed in its use; steady, cautious, patient, and gentle pressure, in the right direction, must never be superseded by sudden and daring force, or irreparable mischief may ensue. "Lightness of hand, and gentleness of manipulation, will often enable a surgeon to overcome difficulties which to others may have proved insuperable. The operation of introducing a catheter through what has been called an impermeable stricture, is without doubt the most difficult in the whole range of surgical practice, and demands all the prudence, science, and skill of a master. The art can only be acquired, and that gradually, by frequent practice." When the stricture is very tight, and has afforded much opposition to the passage of the catheter, and more particularly when the operation has been undertaken on account of retention of urine, it is well to retain the instrument secured in the strictured part for twenty-four or eight and forty hours. The cure is thus much expedited, as well as recurrence of the retention prevented. The presence of the foreign body in the stricture calls up a natural effort for its extrusion, resulting in relaxation of the part, with profuse discharge; and so remarkable is the dilatation thus effected, that on withdrawing the instrument at the end of the time already specified, it is found "lying quite loose" in the passage, although at its introduction it had been grasped most tightly, and firmly fixed in the stricture. Immediately after its withdrawal, a much larger instrument can usually be introduced with ease, and the cure is then proceeded with as in ordinary cases. Sometimes the parts so strenuously resist the presence of the foreign body, that it is prudent to remove the instrument in less time than we have mentioned. Under no circumstances should it be retained beyond two days. It becomes coated with calculous deposit; and, besides, there is danger of its irritation proving excessive; ulceration may take place in the urethra, or abscess form along its course.

Thus the worst possible stricture may be overcome, and the urethra restored to its healthy functions and dimensions. But, as already said, prudence and experience are inseparable from the safe use of the small catheter; with them, it is a most valuable instrument, and saves many a patient now-a-days who would otherwise have become the victim of cruel and dangerous operation. It is seldom, indeed, that we now hear of puncture of the bladder, even by the rectum, a proceeding at one time so common here, as to be known as "the Edinburgh operation." And we as seldom hear of the catheter producing tears and wounds of the urethra, followed by abscess and fistula, or urinary infiltration ending in the death of the patient, or at least in the destruction of a large portion of his genital integument and cellular tissue. When from any cause urine has escaped into the cellular tissue of the perineum, free and deep incision, so as to afford ready escape to the poisonous fluid, cannot be too early resorted to. Should it happen that the surgeon, notwithstanding skill and perseverance, is foiled in passing the catheter, and relieving distention, then, instead of puncturing the bladder, the preferable procedure is to "make a free opening in the perineum, directly upon the obstructed part; to cut upon the end of the catheter, carrying the knife forwards; to open the dilated portion of the urethra, and then to pass the catheter on to the bladder." Thus the viscus is relieved, and a sure commence-

**Surgery.** ment made of the cure of the stricture, while no permanent inconvenience ensues, as after puncture of any part of the bladder. In passing the catheter to relieve retention caused by prostatic disease, it should never be forgotten that the urethra is in such cases much elongated, and that in consequence the instrument ought to be three or four inches longer than those in ordinary use. The treatment of the enlargement of that gland is entirely palliative; nor can proposals for its removal by operation be ranked among the modern improvements.

**Diseases and injuries of the windpipe.**

Diseases and injuries of the windpipe are better understood, and more successfully treated, than formerly. In the latter, the surgeon is less meddlesome, and his patient is benefited accordingly. In wounds of the throat it was formerly the custom, after having secured the larger arterial branches, to proceed at once to closure of the wound, dragging it together by stitches and plasters, and covering all by lint and bandage, as if the principal object were to conceal the horrid gash from view. The consequence was, that the blood which continued to ooze, finding no ready outlet externally, collected in the air-passages, and suffocated the patient, provided, as was most probable, he had not at the time sufficient energy for forcible expectoration; or if this danger was escaped, it was shortly succeeded by one equally imminent, closure of the windpipe at the injured part, from inflammatory swelling of the wound. Now the intelligent surgeon is less precipitate; he knows the danger of the old system, and avoids it by treating cut throat on the same principles as he would an ordinary wound, making no approximation until all oozing has ceased, and then only drawing together the corners, trusting the centre to the more gentle apposition by bending the head forward, and by bandage retaining the chin approximated to the top of the sternum. Thus a free outlet is left to the discharges which must form; for the transverse nature of the wound, and the constant motion of its edges in respiration and deglutition, render union by the first intention impossible. Immediate risks are thus avoided; and if the patient's energy prove sufficient, the wound will gradually close by granulation. But in general, at least in attempted suicides, a low fever ensues, against which all efforts toward cure are unavailing. The patient should be kept in a comfortably warm and equable temperature, and the fore part of the neck should be protected by some loose covering, that the inspired air may be, as nearly as possible, of the same temperature as in natural respiration. Thus the occurrence of bronchitis is so far obviated; and so long as air passes through the wound, no other dressing need be applied. When the pharynx is involved in the wound, nourishment is given from time to time through a tube introduced by the mouth; not through the wound, lest contraction of the tracheal opening should be interfered with, and its edges cicatrize separately, leaving the patient in a very miserable plight. Sometimes respiration becomes obstructed by swelling of the mucous membrane and accumulation of viscid mucus, so as to endanger suffocation, and render it necessary to open the windpipe longitudinally below the obstructed part. In injuries of the interior of the throat, tracheotomy is also sometimes necessary. When the glottis has been injured, for example, by the swallowing of acids, or hot water, or by the inhalation of steam, should the ordinary active treatment fail to arrest the urgent symptoms, tracheotomy must be had recourse to without delay, otherwise the patient will perish, either by immediate suffocation, or by effusion consequent on imperfect pulmonary circulation. A simple blow on the larynx may so completely paralyze the parts, as to render opening of the windpipe necessary for restoring the

respiration. And the operation is also required when foreign bodies have lodged in the air-passages, and cannot be expelled by expectoration. If allowed to remain, they are productive of the greatest annoyance; perhaps suffocation is immediate; and if they do not speedily induce inflammatory action of the most serious nature, they are certain ultimately to occasion phthisis, or other chronic disease of fatal tendency. If the foreign body is loose, it will be spontaneously ejected from the opening; if fixed, it must be dislodged by forceps.<sup>1</sup>

**Surgery.**

In diseases of the air-passages, tracheotomy often becomes necessary, on account of obstruction at the top of the windpipe preventing free entrance of air into the lungs. In acute inflammatory affections, croup, for example, it is seldom admissible. In the early stage, "whilst active antiphlogistic remedies are indicated, and considered likely to afford relief, it could not with propriety be proposed; in the latter stages, after lymph has formed, when the lungs are gorged, and effusion has commenced at the base of the brain, no good purpose can be answered by an operation." Sometimes, in adults, a favourable opportunity for the operation may be selected between these stages, but it is seldom. To the chronic affections the operation is more applicable. Even in phthisis laryngea, the most intractable of these, advantage may be derived from it when performed at an early period; the diseased parts above the opening are set at rest, and an opportunity is afforded of making direct application, through the wound, of the suitable remedies to the ulcerated surface. But it is in œdema of the glottis, whether as a primary affection, or supervening on previous disease, that its beneficial results are most frequent and most apparent; the patient is at once relieved from impending suffocation; the swollen parts are put to rest, and in time subside; and after a while they so far recover their healthy condition, as to admit of closure of the wound and re-establishment of the natural course of respiration. In all cases where opening of the windpipe is required, whether on account of accident or disease, tracheotomy is preferable to laryngotomy, and though a little more difficult, is equally safe in performance. An opening in the cricoid membrane will not always suffice for detection and removal of a foreign body; and being placed in the ordinary site of laryngeal disease, will usually fail to afford relief when undertaken on that account. The incisions in tracheotomy are made very carefully, so that stray vessels may be pushed aside in safety; the trachea is pierced during the act of deglutition, when the larynx is elevated and the windpipe elongated; a silver tube is immediately introduced, of calibre proportioned to the object in view, and of such a form as to prevent oozing from the wound by compression of the edges. After a short time all irritation from the presence of the tube ceases; but during the whole cure great attention must be paid that it be kept clear of the vitiated mucus. It should also be protected by some loose covering, in the same manner and for like reasons as in cases of cut throat. In the treatment of all affections of the throat, the possibility of tracheotomy becoming requisite should always be kept in view; and the curative applications should consequently be confined as much as possible to the sides of the neck, leaving the fore part free, otherwise much difficulty may be thrown in the way of the operator.

The treatment of diseases of the rectum has become simplified and improved along with the rest of surgery. "Many attempts have been made to mystify the subject of diseases of this region, and to separate them in a great measure from general surgery. There is no such difficulty as has been supposed in understanding their nature; the principles

**Diseases of the rectum.**

<sup>1</sup> A most interesting case of foreign body in the bronchus, successfully removed by operation, is detailed by Mr Liston, in his *Practical Surgery*, p. 371.

**Surgery.** which should guide their management are simple, and the means, operative and otherwise, easily enough applied." Of late a variance of opinion has arisen in regard to the treatment after operation on the rectum; one party maintaining that in all cases little or no dressing is required; the other, that in every case stuffing and compression of the wound are essential to the safety of the patient. As is usual when opinions are in extreme opposition, we find that truth occupies a middle place. In some slight cases of operation, for fistula, hæmorrhoids, &c., no more dressing is required than what is sufficient to prevent immediate union of the divided parts; while in others, a degree of compression must be made on the divided surface, proportioned to the extent of the incision and the probability of hæmorrhage. It would be very unnecessary to cram the wound in the first class of cases; in the second, it would be equally unwise to leave the parts wholly unsupported.

**Tumours.** As the pathology of tumours has become more and more understood, operative procedure has been withdrawn from some and extended to others. Diagnosis having become both more easy and more accurate, we can now readily distinguish between those of a benign and those of a malignant disposition. In regard to the latter, experience has taught us to forbear from operative interference, unless at the very first accession of the disease; for though the more simple tumours, even when of large size and long duration, may be removed with every prospect of permanent cure, yet in those of a malignant nature, immunity from recurrence of the disease can be hoped for only when the removal is very early; when the local affection is still limited and loosely attached; when there is a certainty of being able to remove, not only the morbid structure itself, but some portion of the unaltered tissues which invest it; before any affection of the neighbouring lymphatics can be detected; and before the general system seems to have been permanently involved. Among the more benign tumours, the most remarkable extension of active surgery is in regard to the solid tumours of the jaw. Not long since these formidable formations were looked upon with horror and dread, as one and all of the most malignant tendency, and were consequently left to their own course. But now we have been taught that such is not, and ought not to be, the case; that many doubtless are most malignant, and must not be interfered with; but that others, and sometimes even those of the most formidable appearance, are sufficiently local and apathetic to warrant the adoption of active interference with the most sanguine hopes of success. Both the upper and lower jaws, involved in large and frightful tumours, have of late years been removed by operation; and when the case has been judiciously selected, good success has been invariable. In the soft medullary tumour of the upper jaw, commencing in the antrum, an opportunity warranting interference can seldom occur; for before the morbid formation has appeared externally in the mouth or nose, it has not only completely involved the bone in which it originated, but also included in the diseased mass the palate-bone, the ethmoidal cells, the orbit, and even the sphenoidal sinuses.<sup>1</sup> It is only when such a disease, at an early period of its existence, is confined to the antrum, that removal of the superior maxillary bone can be of service; but unfortunately its true nature is seldom discovered until a portion of the tumour has become apparent by the giving way of the parietes; and when that has occurred the case is hopeless, for its extension backwards very far exceeds the outward protrusion. In its first stage the prominence of the cheek has the same smooth glistening appearance as in chronic

abscess of the antrum; but the parietes of the tumour are hard and unyielding; they soon thin at one or more points, there communicating a pulpy feeling to the finger; and when they have completely given way, the ravages of the disease are as rapid as uncontrollable. The more benign tumour in this situation—originating in the bone, and usually the result of injury—is, on the contrary, slow in its progress and of very firm consistence; its surface is lobulated, and if ulcerated by accident, soon heals again; the internal structure, of a firm fibrous character, is limited by a dense cellular cyst; and the neighbouring bones are either simply displaced, or removed more or less by interstitial absorption; the progress of the tumour is in consequence almost entirely towards the surface. It is in such cases that the surgeon does not now hesitate to remove the superior maxillary bone; for with it he knows that he can take the whole diseased formation. It is doubtless a formidable operation, and not unattended with danger; but the risk is insignificant when compared with the ultimate benefit likely to accrue. It is therefore evidently of the highest importance to distinguish accurately these two classes of tumour, the treatment suitable to each being so widely different; in the one case operation is wholly inadmissible, while in the other the sooner it is had recourse to, the greater is the probability of a successful result. Care should also be taken not to confound either with the more simple affection of accumulated fluid in the enlarged antrum; for it has happened that a surgeon, after having made up his mind to attempt removal of the superior maxilla, has, "on trying to divide the connections of that bone, had his hands covered with purulent matter, and himself with shame and confusion." The same general description applies to tumours of the lower jaw as to those of the upper, with this difference, that the relative position of the former somewhat prolongs the favourable opportunity at which tumours even of malignant tendency may be removed. The medullary tumours are also of much less frequent occurrence; there is no large cavity, like the antrum, in which they may originate, and the great majority consequently come under the denomination of osteo-sarcoma. That very many tumours of the jaws are attributable to disease, or even faulty position, of the teeth, and to unskilful dental operations, is a fact as true as it is important, and should direct both surgeon and patient to greater and more frequent attention to those influential little portions of the osseous system. After the operation on either jaw, an unseemly void of course remains; but nature, assisted occasionally by the dentist, does wonders in repairing this, and the actual deformity is in many cases surprisingly slight.<sup>2</sup>

In operations for the removal of tumours in the soft parts, we have elsewhere stated that the incisions should be so planned as to divide the principal vessels at the outset, as thus both time and blood are saved. If the vessels implicated are large, temporary pressure on the trunk may be made by the assistant; but it can seldom if ever be necessary to practise a preliminary operation for the securing of that trunk by ligature. In most cases the dissection of the tumour should be made as rapidly as is consistent with the safety of important parts in the neighbourhood. But when the tumour is suspected of a malignant tendency, the duration of the proceeding must not be considered; the dissection must be methodical and deliberate. As it proceeds, the parts must be examined carefully by both the finger and eye; and on its completion, the removed mass must be minutely surveyed, lest any shred of morbid formation be left in the wound. No successful result can be hoped for, un-

<sup>1</sup> Sometimes these tumours commence in the latter situations, and involve the superior maxillary bone secondarily.

<sup>2</sup> For details of the operation, we again refer to Liston's Practical Surgery; a work of great value, from the perusal of which both practitioner and student will derive much profit, and to which, we beg to acknowledge, we have been not a little indebted in the course of the present article.

**Surgery.** less the whole altered structure is completely and freely removed. Another point in regard to operations on tumours ought never to be forgotten, namely, that the most simple and best dispositioned formations may, in the course of time, degenerate into the most malignant and intractable, and therefore should not be exposed to this contingency; they should be early removed, for the merest steatom has, by circumstances, been transformed into the most frightful and deadly fungus.

Vascular tumours, of erectile tissue, are now safely and efficiently removed by ligature. Formerly they were usually left undisturbed. Sometimes attempts at excision were made, but the results were truly discouraging, the hæmorrhage proving most alarming, and not unfrequently fatal. In a mere nævus, obliteration of the vessels may be safely effected by vaccination, pressure, acupuncture, seton, or the application of escharotics. But such treatment is totally inapplicable to the erectile tumours. These, when very small, may be removed by excision; but it is not a safe proceeding, particularly in young patients, to whom loss of blood is of serious consequence. But by ligature, vascular tumours of almost any size and extent are safely removed, by arresting their circulation, and so producing sphacelus of the adventitious structure. When the formation is of a broad base, several ligatures are required, passed beneath the tumour by needles; and when the integument is free, or but slightly involved, it should be reflected by preliminary incision, so that these ligatures may be the more effectually applied. By such procedure, even enlargement of the thyroid gland may be removed. Of course no one would think of attacking the whole tumour on account of the mere deformity; but it sometimes happens that enlargement of the isthmus occasions difficult respiration, congestion of the cerebral vessels, and other alarming symptoms; and in such cases the offending part has been successfully removed by a combination of incision with ligature, using the knife as deeply as the hæmorrhage will permit, and then completing the isolation of the lobe by strong ligatures applied by transfixion.

**Venereal disease.**

In the treatment of venereal affections, mercurial supremacy has gradually given way to the influence of common sense, and the disease has consequently become more mild and tractable, particularly in its secondary forms. The primary symptoms are treated as simply local affections, until circumstances prove the contrary, which will be comparatively seldom. When the exhibition of mercury seems advisable, little usually suffices; it is used, not abused as formerly.

**Hydrocele.**

Hydrocele, which was at one time the apology for very severe surgical proceedings, by knife, setons, and escharotics, is now under very simple treatment; the palliative, is mere tapping of the cavity; the permanent, injection of it, after tapping, by some gently stimulating fluid, port wine, for example. But great care must be taken during injection, that none of the fluid enter the cellular tissue of the scrotum, otherwise most violent inflammatory action must ensue in the infiltrated parts.

**Restorative surgery.**  
**The nose.**

\* Restorative surgery, in former years scarcely attempted, is now making rapid progress towards perfection. Noses are made and repaired most adroitly, not according to the old inconvenient system of the European father of rhinoplastics, but by a modification of the plan practised by the Koomas, a caste of Hindoos, and first introduced into this country by Mr Carpue. This decorative operation has been very successfully practised by Mr Liston, who is the author of an important change in the procedure—not bringing the columna from the forehead, but waiting till the new apex and alæ so obtained are consolidated, and then fashioning

a column out of the upper lip.<sup>1</sup> By this little operation a more vigorous and substantial support is obtained for the new parts; and, besides, the lip, which formerly hung tumid and pendulous, is at the same time very much improved in appearance. His nasal constructions, he tells us, are scarcely to be distinguished from the natural feature at a little distance, are quite sufficient for the ordinary uses of that organ, and sometimes have been brought to desiderate and enjoy the questionable accomplishment of snuff-taking. He has likewise been very successful in relieving the nose from inconvenient and unseemly encumbrances, produced by lipomatous enlargement of the integument. The excrescence is simply pared off, care being taken not to interfere with the subjacent cartilages. The raw surface usually cicatrizes rapidly, leaving the feature of its natural form and size. By an operation conducted on similar principles as the rhinoplastic, the lower lip is renewed from beneath the chin; the ear, or rather portions of it, from the integument behind; and deficiencies in the urethra can be closed by adaptation of a portion of either the prepuce or loose neighbouring integument. Such proceedings some may affect to disregard as trivial; but they are not looked upon as such by the unfortunate individuals to whom they are applicable, and really constitute a most interesting and useful department of operative surgery.

**Harelip.** Harelip, one of the most disagreeable of the congenital deficiencies, can be very perfectly remedied, by paring the edges of the fissure, and securing them in close and accurate apposition by two or more points of twisted suture. According to the principles already detailed, no further dressing is applied; and if the patient be otherwise in good health, and the parts protected from external injury, adhesion will seldom or never fail to occur. The most important part of the operation, as regards restoration of the lip's natural appearance, is complete removal, by the paring of the rounded margins where the membrane that covers the edge of the fissure joins the true prolabium. If this be not attended to, the operation is imperfect, for a most unseemly notch remains in the lip; in fact, the fissure is merely diminished, not obliterated. But when these rounded portions are completely removed, and the operation is in other respects well conducted, a mere line of cicatrization is all that remains of the deformity.

**Club-foot.** Club-foot, a most inconvenient as well as unseemly malformation, is remedied in children by simple means; merely applying the necessary retentive apparatus, until the parts become fixed in the normal position in which that apparatus places them. Now, the cure is extended even to the adult; and very many varus feet, formerly regarded as irremediable, are restored to usefulness and symmetry, at the cost of but slight pain and inconvenience. The first part of the treatment is to sever the tendo Achillis; an operation simple in performance, and seldom if ever followed by any untoward results. A narrow knife or lancet-shaped needle is introduced obliquely through the integument, beneath the tendon, and at a little distance from it on one side; "by directing the edge against the resisting fibres, the foot being kept powerfully extended by an assistant, the object can be effected with scarcely a perceptible external wound, and with the escape of only a drop or two of blood." The foot is then placed in the desired position, and retained so by the suitable apparatus, for the necessary period; the foot becomes both "useful and ornamental;" and the space between the separated ends of the divided tendon is, after no long time, firmly and completely occupied by a new formation, of tendinous structure and capabilities, by means of which the functions of the muscles are ultimately restored.

<sup>1</sup> The columnar slip includes the whole thickness of the lip, and in its application is not twisted. The mucous membrane, after exposure in its new situation, soon becomes cuticular in both appearance and function.

*Surgery.* A similar operation has been for some time in practice in the veterinary profession. It was first performed on the human body by the continental surgeons. After dividing the tendon, they again brought the retracted ends together, and retained them in apposition until partial reunion took place, when, by gradual extension, the new formation was elongated to the extent necessary for the adjustment of the foot. This method, however, is both more tedious and more painful than the one already described; and by either, the repair is equally substantial and efficient. In some cases of the deformity, the bones are either so deficient in original development, or so firmly secured in their malposition, as to be irremediable even by such means. But, as already stated, there are very many cases, both of simple extension of the foot, and of that complicated with inversion, in which this little operation, well seconded by the care of the machinist, will be followed with success almost equal to the most sanguine hopes of both surgeon and patient. *Surgery.*

We have thus briefly sketched the subjects which naturally occur to us, as the most prominent examples of the modern advancement of surgery. It were easy to swell the list. But our assigned limits have already been attained, if not exceeded; and enough has probably been said, both to convey a general idea of the improvement recently effected in this profession, and to encourage a hope that such progress will still continue, year after year, bringing the practice of this useful, enlightened, and noble art, closer to perfection. (c. D.)

FINIS.

